



**SOUTH CAROLINA**  
**LAW ENFORCEMENT DIVISION**

*Forensic Services Laboratory*  
**Evidence Submission Manual**  
May 2020

## TABLE OF CONTENTS

---

INTRODUCTION .....	5
Forensic Services Laboratory – Mission Statement.....	5
GENERAL EVIDENCE SUBMISSION INFORMATION.....	6
FORENSIC SERVICES LABORATORY LOCATION .....	7
COMPUTER CRIME CENTER LOCATION .....	7
CONTACT INFORMATION.....	8
Email.....	8
USING THE LABORATORY IN THE JUDICIAL PROCESS.....	9
COMPUTER CRIME CENTER .....	10
I. Capabilities and Services.....	10
II. Evidence Collection, Packaging, and Submission Procedures.....	10
III. Special Considerations .....	11
IV. Report Interpretation .....	11
CRIME SCENE DEPARTMENT.....	12
<i>CRIME SCENE</i> .....	12
<i>FOOTWEAR/TIRE TREAD EVIDENCE</i> .....	12
I. Capabilities and Services.....	12
II. Evidence Collection, Packaging, and Submission Procedures.....	13
III. Special Considerations .....	13
IV. Report Interpretation .....	14
<i>BLOODSTAIN PATTERN ANALYSIS/CRIME SCENE RECONSTRUCTION</i> .....	14
I. Capabilities and Services.....	14
DNA CASEWORK DEPARTMENT .....	15
I. Capabilities and Services.....	15
II. Evidence Collection, Packaging, and Submission Procedures.....	16
III. Special Considerations .....	28
IV. Report Interpretation .....	29
DNA DATABASE DEPARTMENT .....	30
<i>COMBINED DNA INDEX SYSTEM (CODIS)</i> .....	30
I. Capabilities and Services.....	30
II. Database Sample Collection, Packaging, and Submission Procedures .....	31
III. Special Considerations .....	32
IV. Match Confirmation Letter Interpretation .....	32
DRUG ANALYSIS DEPARTMENT.....	33

I. Capabilities and Services .....	33
II. Evidence Collection, Packaging, and Submission Procedures .....	33
III. Special Considerations .....	36
IV. Report Interpretation .....	38
V. Destruction of Evidence .....	38
EVIDENCE CONTROL DEPARTMENT .....	41
I. Capabilities and Services .....	41
II. Evidence Collection, Packaging and Submission Procedures .....	41
<i>iLAB Submission Process and Procedures</i> .....	43
III. Special Considerations .....	43
IV. Report Interpretation .....	44
FIREARMS & TOOL MARKS DEPARTMENT .....	45
<i>FIREARMS EVIDENCE EXAMINATION</i> .....	45
I. Capabilities and Services .....	45
II. Evidence Collection, Packaging and Submission Procedures .....	45
III. Special Considerations .....	49
IV. Report Interpretation .....	49
V. Case Acceptance Guidelines .....	50
<i>INTEGRATED BALLISTICS IDENTIFICATION SYSTEM (IBIS)</i> .....	53
IBIS OVERVIEW AND TRADITIONAL EVIDENCE SUBMISSION .....	53
I. Capabilities and Services .....	53
II. Evidence Collection, Packaging and Submission Procedures .....	53
III. Special Considerations .....	54
IV. Report Interpretation .....	55
<i>INTEGRATED BALLISTICS IDENTIFICATION SYSTEM (IBIS)</i> .....	57
IBIS ENTRY BY APPOINTMENT .....	57
I. Capabilities and Services .....	57
II. Evidence Collection, Packaging and Submission Procedures .....	57
III. Special Considerations .....	58
IV. Report Interpretation .....	58
LATENT PRINT DEPARTMENT .....	59
<i>EVIDENCE PROCESSING FOR LATENT PRINTS &amp; LATENT PRINT EXAMINATION</i> .....	59
I. Capabilities and Services .....	59
II. Evidence Collection, Packaging, and Submission Procedures .....	59
III. Special Considerations .....	60

IV. Report Interpretation .....	61
<i>AUTOMATED FINGERPRINT IDENTIFICATION SYSTEM (AFIS)</i> .....	63
I. Capabilities and Services .....	63
II. Evidence Collection, Packaging, and Submission Procedures .....	63
III. Special Considerations .....	63
IV. Report Interpretation .....	63
<i>PHOTOGRAPHY STUDIO</i> .....	65
I. Capabilities and Services .....	65
II. Evidence Collection, Packaging, and Submission Procedures .....	65
QUESTIONED DOCUMENT DEPARTMENT .....	66
I. Capabilities and Services .....	66
II. Evidence Collection, Packaging, and Submission Procedures .....	66
III. Special Considerations .....	69
IV. Report Interpretation .....	69
TOXICOLOGY DEPARTMENT .....	70
I. Capabilities and Services .....	70
II. Evidence Collection, Packaging, and Submission Procedures .....	71
III. Special Considerations .....	78
IV. Report Interpretation .....	78
TRACE EVIDENCE DEPARTMENT .....	80
I. Capabilities and Services .....	80
II. Evidence Collection, Packaging, and Submission Procedures .....	82
III. Special Considerations .....	86
IV. Report Interpretation .....	87

## INTRODUCTION

---

The SLED Forensic Services Laboratory is a full service crime laboratory that serves criminal justice agencies throughout South Carolina. The laboratory began operation in the early 1950s and has steadily grown during ensuing years. Pursuant to § 23-3-15, 1976 South Carolina Code of Laws, as amended, SLED is given exclusive statewide jurisdiction to operate a comprehensive forensic laboratory on behalf of the State. Services are provided to local, state, and federal agencies for cases involving suspected criminal activity. The laboratory's operating hours are 8:30 A.M. to 5:00 P.M., Monday – Friday (excluding state holidays). All departments have staff on call for responses after normal business hours.

The laboratory is currently accredited by the ANSI National Accreditation Board (ANAB) and meets the requirements of ISO/IEC 17025:2017. Accreditation provides a means for the formal recognition, by an independent third party, that the laboratory is in full compliance with the appropriate standards. Accreditation is maintained through regular surveillance activities to assess continued compliance with accreditation requirements. The laboratory was initially accredited in 1994 by ASCLD/LAB (American Society of Crime Laboratory Directors/Laboratory Accreditation Board) under the Legacy program. Legacy program reaccreditation was granted in 1999, 2004, and 2009. As ASCLD/LAB transitioned to the ISO/IEC 17025 based program, the laboratory underwent assessment and obtained ASCLD/LAB-*International* Accreditation in 2014. In 2016, ANAB announced the merger of its forensics operations with those of ASCLD/LAB. The laboratory's current scope of accreditation can be accessed on the [ANAB website](#) and the [SLED website](#). Additionally, the DNA Casework and DNA Database Departments meet all criteria set forth by the FBI's *Quality Assurance Standards for Forensic DNA Testing Laboratories* and *Quality Assurance Standards for Forensic DNA Databasing Laboratories*.

The laboratory is composed of an administrative component (Forensic Administration) and the following departments: Computer Crimes, Crime Scene, DNA Casework, DNA Database, Drug Analysis, Evidence Control, Firearms, Forensic Technology, Implied Consent, Latent Print, Questioned Documents, Toxicology, and Trace Evidence. Each department has specific capabilities and services in its area of responsibility. The Forensic Technology Department administers the iLAB system, a web-based system for pre-logging cases for submission to the laboratory. The Implied Consent Department regulates the breath testing program for the State of South Carolina. This department certifies, inspects, repairs and maintains the Datamaster DMT Program.

---

### FORENSIC SERVICES LABORATORY – MISSION STATEMENT

---

*To provide the South Carolina criminal justice system with a full-service forensic laboratory staffed with persons of the highest possible ethical and educational standards who examine forensic evidence and report findings of the highest quality possible.*

## GENERAL EVIDENCE SUBMISSION INFORMATION

---

The South Carolina Law Enforcement Division (SLED) Forensic Services Laboratory Evidence Submission Manual has been developed to provide the criminal justice community with information concerning procedures for the collection, preservation, and submission of physical evidence. This manual is not intended to address all situations or to supersede agency policies or procedures. Although the laboratory intends to make periodic updates and changes to this manual, it is recommended that customers stay abreast of changes that will inevitably occur over time due to changes in technology within the specific disciplines.

As a result of the cooperative efforts of this laboratory, these guidelines are set forth to maximize analytical results and to encourage the optimal use of the services offered. Laboratory staff, working in conjunction with the investigating officer, determines specific capabilities and services that are applied to a case based on the totality of the circumstances.

Submitted evidence must be pre-logged using [iLAB](#) and accompanied by a Packing Slip. Computer Crimes submissions require an Evidence Intake form and either a Search Warrant or Consent to Search. In addition, an Incident Report is also required for all cases except for Computer Crimes and Drug Analysis cases.

**All items of evidence must be properly sealed and marked with the initials and date of the sealing official.** Proper seal is a seal that prevents loss, cross transfer, or contamination while ensuring that attempted entry into the container is detectable. A proper seal may include a heat seal or tape seal. The date and initials of the person creating the seal shall be placed on the seal or across the seal onto the container when possible. **Items received not properly sealed will be noted in the case record.**

For more information on packaging and submission of evidence refer to the [Evidence Control section](#) of this manual. For specific packaging and submission information refer to the relevant department's section of this manual. Evidence which is not properly sealed or packaged upon submission may be returned to the submitting agency without analysis or the condition of the evidence when received will be appropriately documented. *Items submitted to the Computer Crime Center are not required to be sealed.*

In the event of a request that is outside of the case acceptance guidelines, it is essential to make contact and receive approval via phone or email with laboratory management prior to delivering the evidence to SLED. The laboratory's Evidence Control department cannot accept requests that are outside the case acceptance guidelines without documented approval. It is also recommended that the submitting agency contact the appropriate department to triage evidence on complex cases.

If any questions arise concerning the collection, preservation or submission of forensic evidence, customers are encouraged to contact Forensic Services at (803) 896-7300 to obtain assistance from the appropriate department.

## FORENSIC SERVICES LABORATORY LOCATION

---

**Physical Address:**

SLED Forensic Services Laboratory  
4416 Broad River Road  
Columbia, SC 29210

**Mailing Address:**

SLED Forensic Services Laboratory  
P.O. Box 21398  
Columbia, SC 29221-1398

**Directions to the Laboratory:**

From Greenville/Spartanburg: On I-26 West, take exit 106, St. Andrews Road. Turn left at the stop light onto St. Andrews Road. Follow St. Andrews Road 0.7 miles. Turn left onto Broad River Road. Continue 1 mile. SLED Forensic Services Laboratory is located on the right.

From Charleston: On I-26 East, take exit 106B, St. Andrews Road, East. Merge onto St. Andrews Road. Follow St. Andrews Road 0.6 miles. Turn left onto Broad River Road. Continue 1 mile. SLED Forensic Services Laboratory is located on the right.

## COMPUTER CRIME CENTER LOCATION

---

**Physical Address:**

SLED Computer Crime Center  
1731 Bush River Road  
Columbia, SC 29210

**Mailing Address:**

SLED Computer Crime Center  
P.O. Box 21398  
Columbia, SC 29221-1398

**Directions to the Computer Crime Center:**

From Greenville/Spartanburg: On I-26 East, take exit 108A, Bush River Road. Turn right onto Bush River Road. Continue approximately 1 mile. The SLED Computer Crime Center is located on the right.

From Charleston: On I-26 West, take the I-126/Bush River Road exit, exit 108B-A, toward Columbia. Take Exit 108A on the left toward Bush River Road. Turn left onto Bush River Road. Continue approximately 1 mile. The SLED Computer Crime Center is located on the right.

## CONTACT INFORMATION

---

Main Laboratory	803-896-7300
Forensic Administration	803-896-7381
Computer Crime Center	803-896-7901
Crime Scene	803-896-7299
DNA Casework	803-896-7383
DNA Database (CODIS)	803-896-7383
Drug Analysis	803-896-7379
Evidence Control	803-896-7302
Firearms - (IBIS and Evidence Examination)	803-896-7399
Implied Consent	803-896-7362
Forensic Technology (iLAB)	803-896-7213
Latent Print	803-896-7299
Photo Studio	803-896-7295
Questioned Document	803-896-7298
Toxicology	803-896-7385
Trace Evidence	803-896-7347
Main Laboratory-After business hours (SLED Operations)	803-737-9000
Computer Crime Center-After business hours	803-896-7133
Main Laboratory Fax	803-896-7351

---

### EMAIL

---

General Lab Contact	<a href="mailto:sledlab@sled.sc.gov">sledlab@sled.sc.gov</a>
DNA Database/CODIS	<a href="mailto:codis@sled.sc.gov">codis@sled.sc.gov</a>
DNA Casework	<a href="mailto:sleddna@sled.sc.gov">sleddna@sled.sc.gov</a>
Firearms/IBIS Program	<a href="mailto:IBIS@sled.sc.gov">IBIS@sled.sc.gov</a>
iLAB/LIMS Administrator	<a href="mailto:ilabrequests@sled.sc.gov">ilabrequests@sled.sc.gov</a>
Discovery (Rule 5) Requests for Laboratory Documents/Document Release Coordinator	<a href="mailto:sledlabdoc@sled.sc.gov">sledlabdoc@sled.sc.gov</a>
Drug Destructions	<a href="mailto:drugdestruction@sled.sc.gov">drugdestruction@sled.sc.gov</a>



## USING THE LABORATORY IN THE JUDICIAL PROCESS

---

In addition to conducting examinations and comparisons of various types of physical evidence, analysts are available to present expert testimony concerning their findings before the courts. In order to be of maximum assistance, the following procedures should be followed:

- Notify laboratory personnel, as far in advance of the trial as possible, so that time will be available for proper court preparation.
- When using email as the form of notification keep in mind that some laboratory personnel do not have access to SLED email after normal business hours.
- Due to the number of cases being handled by each analyst and/or technician, it is critical to issue subpoenas as early as possible. If conflicts exist with multiple subpoenas, it may be necessary for court officials to communicate with each other to resolve them.
- The SLED laboratory case number should be referenced on any subpoena issued to laboratory personnel.
- For all cases, in addition to the subpoena to appear in court, information should be furnished as to the actual date and approximate hour when the analyst and/or technician will be needed. Time spent waiting while juries are being selected, motions are being heard, or other witnesses are being examined is unwarranted. The waiting time precludes more constructive work at the laboratory and interferes with other court appearances.
- Immediately notify the appropriate analysts and/or technicians of any change in trial or appearance dates, such as continuances or guilty pleas.
- Normally, there is no fee for expert testimony or any other laboratory service; however, in specific situations, such as civil trials and depositions which do not involve the State as a party of interest, a witness fee may be charged.
- It may not be necessary for chain of custody witnesses or evidence intake personnel to testify as all analysts are familiar with evidence intake procedures and can testify to these procedures as well as testify to the laboratory's internal chain of custody.
- When scheduling laboratory personnel for court who are **solely** chain of custody witnesses keep in mind the SC Court of Appeals ruling, *State v. Hatcher*, which states:
  - "each person who handled the evidence is not required to testify." When "other evidence establishes the identity of those who have handled the evidence and reasonably demonstrates the manner of handling of the evidence"
  - "the chain of custody is only required to be established as far as is reasonably practicable, South Carolina courts have consistently held that all persons in the chain of custody must be identified and the manner of handling the evidence must be demonstrated"

A chain of custody may be obtained prior to trial by contacting the Forensic Services Administrative Assistant at (803) 896-7381. For a Computer Crimes chain of custody, contact the Computer Crime Center at (803) 896-7901. Additionally, technical records supporting the conclusions in laboratory reports are available upon request. To request the laboratory case file, contact the Document Release Coordinator at (803) 896-4451 or [sledlabdoc@sled.sc.gov](mailto:sledlabdoc@sled.sc.gov) and provide the laboratory case number and trial date. Allow 4 weeks for processing of the request.

---

## COMPUTER CRIME CENTER

---

### **I. CAPABILITIES AND SERVICES**

The SLED Computer Crime Center (SC3C) encompasses the preservation, processing, and analysis of evidence in an analog or digital format and is responsible for providing expertise to local, state, and federal law enforcement agencies in the scientific examination, repair (if possible), analysis and/or evaluation of electronically stored information contained on a wide variety of data storage devices. These devices include, but are not limited to: computer systems, such as servers, desktops, digital video recorders (DVR), and laptops; mobile devices, such as cellular telephones and tablets; digital storage devices, such as hard disk drives, flash memory, and optical discs; gaming devices, such as Xbox and PlayStation.

### **II. EVIDENCE COLLECTION, PACKAGING, AND SUBMISSION PROCEDURES**

Several issues should be considered during the evidence collection process. These include, but are not limited to the following: scene location, condition of evidence, weather conditions and evidence packaging. Photographs should be taken to document evidence. Consult with the case agent regarding the necessary equipment to take to the scene. Review the legal authority to seize the evidence. When it is impractical to remove the evidence from the scene, it should be copied or imaged. The scene should be searched systematically and thoroughly for evidence. If a computer is turned off, do not turn the computer on. If a computer is turned on, a computer forensic specialist should be consulted first before powering down. If encryption software is installed, appropriate forensic methods should be utilized to capture the encrypted data before the computer is powered down. Cell phones and tablets should be placed in airplane mode or radio frequency shielded for evidence preservation before submission. Batteries should be removed from laptops. Certain power cords are proprietary and must accompany the electronic evidence.

Physical evidence to be analyzed by the Computer Crime Center is submitted directly to the Computer Crime Center. When submitting evidence to the SLED Computer Crime Center, the Evidence Intake form must be completed and a copy of a Search Warrant or Consent to Search containing model and serial numbers of each item for exam must accompany the evidence. Only one intake sheet and one search warrant is needed per case as long as all items are listed on it. Any passwords or swipe lock patterns should be listed on the Evidence Intake form. An exam can only follow the scope of the Search Warrant or Consent to Search. Anything outside of the scope will require an additional warrant or consent. Items are not required to be evidence sealed as most items are too large to seal. Any items deemed a biohazard should be labeled and packaged appropriately. Any sealed items submitted, will be unsealed at time of intake, photographed and serial numbers will be confirmed to the Search Warrant or Consent

to Search. If identifying information is incorrect, a corrected Search Warrant/Consent will need to be submitted before any exam can take place. Evidence must be picked up to complete the exam process and before a report can be released.

### **III. SPECIAL CONSIDERATIONS**

A request for SLED Computer Crime Center onsite assistance must be presented to the Lieutenant or Captain for approval. An onsite preview and/or examination of evidence requests must consist of a recognized incident. If approval is granted, the Computer Crime Center will contact the requesting agency and give them an ETA (expected time of arrival).

### **IV. REPORT INTERPRETATION**

The Computer Crime Center reports contain chain of custody receipts. For this reason, all evidence must be picked up by the submitting agency before a report can be finalized. Final reports are burned to a computer disc which can be mailed or the submitting agency may pick up. There will be two discs given - one for the agency and an extra copy. In the event the report is too large to burn to a disc, the forensic agent will contact the submitting agency to discuss report retrieval options.

## CRIME SCENE DEPARTMENT

---

### CRIME SCENE

#### I. CAPABILITIES AND SERVICES

Special Agents of the South Carolina Law Enforcement Division (SLED) Crime Scene (CS) Department respond to crime scene requests from local, state, and federal law enforcement agencies throughout the 46 counties of the state. The department may also respond to crime scenes outside of SC if an ongoing investigation extends into another state.

SLED CS Agents are Class I Law Enforcement Certified and respond to crime scene requests 24 hours a day, 7 days a week. SLED CS Agents respond to scenes such as:

- Officer-Involved Shootings
- Homicides
- Suicides
- Child Fatalities
- Large-scale property crimes

While on scene, SLED CS Agents investigate and document the crime scene as well as locate, collect, and process evidence related to the case. In addition, Agents are trained to perform job functions in Advance Digital Photography, Footwear/Tire Tread Examinations, or Bloodstain Pattern Analysis/Crime Scene Reconstruction Examinations (BPA/CSR).

Requests for crime scene assistance should be made through the SLED Operations Desk at (803) 737-9000.

### FOOTWEAR/TIRE TREAD EVIDENCE

#### I. CAPABILITIES AND SERVICES

The Crime Scene Department conducts examinations and comparisons of footwear and tire tread evidence. Identification of impressions made by a particular shoe or tire is based upon the correspondence of discernible individual characteristics (i.e., accidental or deliberate markings on the tread surface) sufficient in number and/or uniqueness to rule out coincidence. If insufficient characteristics are present, it will not be possible to make a positive identification.

The presence of corresponding class characteristics (i.e., basic outsole design, tread design, overall physical dimensions, etc.) may permit the conclusion that an impression could have been made by a particular shoe or tire. However, in these cases, the

stipulation must be made that the impression could also have been made by any other shoe or tire possessing the same class characteristics.

It should be noted that the size of questioned impression outsole does not necessarily correlate to the “shoe size”.

## **II. EVIDENCE COLLECTION, PACKAGING, AND SUBMISSION PROCEDURES**

The Crime Scene Department will conduct examinations of footwear and tire tread impressions from photographs, gel lifts and casts.

All questioned footwear and tire tread impressions should be photographed with and without a scale. A flash should be used to provide oblique lighting when photographing three-dimensional impression evidence. The camera should be positioned at 90 degrees with the impression. Failure to do this will not allow for a 1 to 1 reproduction of the image and may limit the examiner’s ability to conduct an examination.

Shoes obtained by submitting agencies that need examination to unknown impressions should be submitted as soon as possible, preferably with the initial submission of the questioned impressions. Do not attempt to remove any debris from the shoe outsole, but rather submit the shoes in the same condition as when they were acquired. If known shoes are not available at the time of the initial submission, it is imperative they be submitted as soon as they are secured. The longer a person wears the shoes after making the questioned impression(s), the more difficult it may be to associate the shoes with the impression(s).

Do not prepare test impressions of the known shoes in lieu of submitting the shoes. Examiners benefit from having the actual shoes and prefer to prepare their own test impressions.

If the agency has secured a vehicle of interest in the investigation for the purposes of a tire tread examination, secure the vehicle and contact the Crime Scene Department. The case agent or on call crime scene agent will coordinate the collection of known tire standards. Submitting tires to the laboratory prior to obtaining proper test impressions may limit the examiner’s ability to conduct an examination. Department personnel are trained and willing to assist with the creation of known tire standards.

All footwear and tire standards should be submitted with the original evidence submitted for comparison.

## **III. SPECIAL CONSIDERATIONS**

If known shoes or tires are not available for comparison purposes, consider retaining the questioned impressions until standards become available. If assistance is needed with

attempting to identify the manufacturer of a shoe or tire represented in the questioned impression the Crime Scene Department should be contacted prior to submission of the evidence to the laboratory.

#### **IV. REPORT INTERPRETATION**

- Positive identifications will be reported as "...was made by the Item # shoe (tire)". This result means that the listed shoe (tire) is the source of the questioned impression to the exclusion of all other sources.
- Eliminations will be reported as "...not made by the Item #/shoe (tire)". This result means that the listed shoe (tire) is not the source of the questioned impression.
- At other times, an association between the questioned impression(s) and known shoe (tire) may be determined, although this association will fall short of the positive identification. Results in these cases will state that the questioned impression corresponds in combined class characteristics, with further possible correspondence of wear and/or random characteristics, with the known shoe (tire). While this association may be significant, it does allow the possibility that another shoe (tire) may be the actual source, assuming it would exhibit the same correspondence in combined class characteristics, as well as wear and/or random characteristics, as applicable.
- Occasionally the quality of the questioned impression is insufficient for conducting a meaningful comparison. In these cases, the report will state that "No conclusion shall be rendered due to the quality of Item #."
- If a questioned impression is submitted and known shoes (tires) are not available for comparison, the report will simply state a result of "Partial footwear (tire tread) impression. Please submit known shoes (tires) for further examination."
- If a questioned impression is submitted with no scale present, this may limit the result that can be reported. In these cases the report will state "... corresponds...with the Item # shoe (tire). Further examination cannot be conducted due to the quality of the Item # impression."

### ***BLOODSTAIN PATTERN ANALYSIS/CRIME SCENE RECONSTRUCTION***

#### **I. CAPABILITIES AND SERVICES**

The Crime Scene Department provides bloodstain pattern analysis and crime scene reconstruction services when requested. It is recommended that the department supervisor be contacted prior to submission of such cases to the laboratory in order to ensure that necessary documentation and evidence is submitted for examination. Requests for crime scene assistance related to bloodstain evidence should be made through SLED Operations at (803) 737-9000.

## DNA CASEWORK DEPARTMENT

---

### I. CAPABILITIES AND SERVICES

The DNA Casework Department performs scientific analyses on biological evidence such as blood, semen, and saliva. Technicians and analysts evaluate available information to understand the nature of the case and what questions need to be addressed. They then examine submitted evidence items to locate and identify probative biological samples.

The DNA Casework Department is comprised of two sections (Serology and DNA Analysis) that perform the following functions related to the analysis of biological evidence:

- Evidence Processing – Typically performed by the Serology section, and consists of examination of items of evidence for the potential presence of biological stains (such as blood, semen, and saliva), hairs, fibers, or other informative evidence. If potential evidence is identified, it is carefully collected and forwarded to the appropriate department or section for further analysis.
- Serology – Most often performed by the Serology section and consists of testing to indicate or identify the presence of body fluids. A direct-to-DNA approach for most cases will be implemented as soon as practical. This will involve a transition to only performing serology analysis when case circumstances require the identification of a body fluid.
- DNA Analysis – Performed by DNA analysts on samples forwarded from and prepared by Serology or samples submitted from outside agencies that do not require processing.

DNA analysis is performed on evidentiary samples and known DNA standards using Short Tandem Repeat Polymerase Chain Reaction (STR-PCR) DNA technology. The DNA profile developed from the sample(s) is compared to DNA profiles developed from individuals involved in the case to determine inclusion or exclusion of the person identified as a possible source of the profile in question. Statistical analysis provides weight or meaning to positive associations.

The DNA Casework Department provides Sexual Assault Evidence Collection Kits and Suspect Evidence Collection Kits to medical facilities throughout South Carolina to aid in standardizing collection of sexual assault evidence. All kits were developed in conjunction with medical, legal, and law enforcement communities.

When necessary in criminal cases, the DNA Casework Department can assist in arranging for private laboratories to perform DNA testing not performed at SLED such as

mitochondrial DNA testing or Genealogy testing. The cost of testing performed by a private laboratory is generally the responsibility of the requesting agency.

Due to high demand for DNA analysis and in an effort to reduce the number of cases awaiting analysis, the SLED Forensic Services Laboratory, through the DNA Casework Department, may outsource analysis of some DNA cases to private vendor laboratories.

Vendor laboratories utilized for outsourcing must be accredited and must process casework samples in accordance with the *FBI Quality Assurance Standards for Forensic DNA Testing Laboratories*. These are the same standards that govern DNA analysis at SLED. Analytical data and final reports are reviewed by DNA analysts at SLED and qualifying DNA profiles are entered into the Combined DNA Index System (CODIS). Once the review process is complete, these reports are available via iLAB. Reports will be mailed if the submitting agency does not have access to iLAB.

## **II. EVIDENCE COLLECTION, PACKAGING, AND SUBMISSION PROCEDURES**

### ***Evidence Collection and Packaging***

DNA evidence can be collected from a wide variety of sources. Great care must be taken in the collection and preservation of DNA evidence due to the potential for cross contamination and degradation.

Personal Protective Equipment (PPE) should be worn when collecting biological evidence to minimize the risk of exposure to hazardous pathogens such as the human immunodeficiency virus (HIV) and the hepatitis B virus.

For questions regarding evidence collection and packaging or case submissions for the DNA Casework Department, the preferred form of contact is via the following email address: [sleddna@sled.sc.gov](mailto:sleddna@sled.sc.gov). If a phone call is necessary, the departmental number is (803) 896-7383.

Investigators and DNA Casework Department staff should work together to determine the most probative evidence and establish priorities.

The following are general guidelines for evidence collection, preservation, and submission; however, officers should always contact the DNA Casework Department when questions arise.

### **General Guidelines:**

1. Properly document and label all evidence with a description of item; date, time and location of collection; identity of the collector.
2. **Properly seal** all evidence and initial and date the seal.



3. Submit only potentially probative evidence. Items that cannot be used to associate the victim or subject with the crime should not be submitted.
4. Known standards and samples collected at autopsy should NOT be packaged with evidence. Place them in separate heat sealed packages. Bullets collected from a body are considered Firearms evidence, and should be packaged separately from samples collected from the body for Toxicology or DNA analysis.
5. For each item submitted for DNA analysis, adequate information regarding how the item is related to the crime is required. For instance, if a hat left at the scene does not belong to the victim and is known not to have been present prior to the time of the incident, we must be provided that information. If relevant information is not provided at intake, the evidence may not be accepted or the item may not be analyzed.
6. Maintain a complete and proper chain of custody on all evidence beginning at the time of collection.
7. Wear disposable gloves and change them often while collecting or handling evidence.
8. Instruments such as scissors or tweezers should be disposable or *must* be cleaned thoroughly before and after collection of each sample.
9. Avoid talking, sneezing, and coughing over evidence. Avoid allowing sweat to drip onto evidence.
10. Avoid touching your face, nose, mouth, and hair when collecting and packaging evidence.
11. It is generally preferred that the entire item be submitted. If this is not possible or practical, stains may be cut out or swabbed. Swabs must be completely air-dried prior to packaging. Care must be taken to minimize potential contamination.
12. Tools used for collection of samples at autopsy must be disposable or decontaminated between uses. Cross contamination between cases must be avoided.
13. When submitting clothing, the submitter must indicate the probable owner or source of the clothing and the location where it was recovered. A name and/or the designation of suspect or victim and a brief description of the recovery location should be included in the item description. (Example: "Shirt left at incident location by suspect." (provide name if known) or "Pants worn by John Doe when arrested.")
14. Generally, items should be packaged separately (especially items that may contain DNA from different sources) in new paper bags or envelopes, not plastic bags. Items packaged in the same inner container will be treated as one item.
15. Do not use staples to seal packaging or attach paperwork to the packaging, as they have the potential to tear gloves and/or injure the skin of the person opening the package.
16. When collecting dried blood (or other body fluids), the use of a double-swab technique is recommended:
  - a) Use a swab moistened with sterile water to collect the stain.
  - b) Using a second dry swab, go back over the same area and collect any remaining sample. Submit both swabs in the same container.

17. When collecting hairs, do not use tape for collection and transport. It is recommended that hairs be placed on or across the adhesive area of a clean piece of sticky note paper. The sticky note paper should then be carefully folded and placed into an appropriate outer envelope. Ensure all hairs are affixed to prevent them from flying out when the outer container is opened. If they are small or very fine, draw an arrow or some other indication of where the hair of interest is located.
18. Do not submit ashes and other debris from ashtrays.
19. Air-dry evidence thoroughly before packaging into paper bags or envelopes. Avoid moisture and air-tight packaging, as this allows mold to grow and may affect the ability to obtain DNA results. As much as possible, avoid folding items while wet, as this may cause the transfer of stains from one area of the item to another.
20. Allow items to dry out of direct sunlight in a manner that prevents cross-contamination. We have large hoods that may be utilized if limited space or equipment is an issue. Any evidence unable to be dried must be submitted as soon as possible. **If evidence is being submitted damp or wet, notify Evidence Control personnel when the evidence is being submitted so arrangements can be made for the evidence to be properly dried. Notification prior to submission of wet evidence is preferred.**
21. Direct sunlight and extreme heat are harmful to DNA. Avoid storing evidence in locations that may get hot, such as a room with no air conditioning or trunk of a police car.
22. Avoid storing biological evidence in areas prone to high humidity. Generally, a normal air-conditioned environment is acceptable for long-term storage of properly dried and packaged DNA evidence. Long term refrigeration without humidity control can introduce damp conditions from condensation and encourage mold.
23. Sexual assault kits should be refrigerated prior to submission *only* if there are any liquid components collected (i.e. blood or urine for Toxicology testing); if there are no liquid components collected, room temperature storage is appropriate. When a sexual assault kit is returned from SLED to the submitting agency it may be stored at room temperature.
24. **In most cases, buccal swabs collected on regular sterile cotton swabs are the preferred sample for known standards.** Buccal swabs or blood spotted and dried on FTA<sup>®</sup> paper is generally the preferred known standard from autopsy submissions. If liquid blood must be submitted, the tubes containing liquid blood should be refrigerated prior to submission, and should be packaged in a separate container to prevent possible contamination of other items due to leakage. (Sexual Assault kits are the exception). Do not freeze liquid blood.

## ***Evidence Submission Procedures and Information***

### **Required Case Information:**

It is imperative that information accompanying all case submissions for DNA analysis be as accurate and complete as possible. Improper submissions create additional work and can unnecessarily delay analysis of the case or completion of a report. Prior to submission, the submitting agency must verify evidence descriptions and ensure that names are spelled correctly.

Information accompanying case submission must be sufficient for examiners to determine the proper analysis procedures. An incident report may not contain adequate information to determine the significance of the evidence that is submitted. Submission questions are required for every DNA submission, and must be filled out appropriately. Submitters are also encouraged to utilize the comment section of packing slips to convey information that may be pertinent to analysis of the case. *If required information does not accompany the submission of the case, it may not be analyzed until this information is provided.*

The type and number of evidence items accepted per submission is based on case type and is outlined below.

**Contact the laboratory prior to submission of additional items of evidence for cases where evidence has already been submitted for the DNA Casework Department.**

Required Known Standards:

Generally, reference samples (known standards) from both the victim(s) and suspect(s) (when known) are necessary to initiate DNA testing.

Sexual assault kits are an exception to this policy. Testing of these kits will proceed without a suspect known standard provided a known standard from the victim is submitted.

Known DNA standards collected for comparison to evidence in a case must be obtained through consent or a court order. They cannot be obtained under the authority of the State DNA Database statute.

AUTOPSIES: Samples collected at autopsy must be packaged properly. Submission paperwork must properly identify what is being submitted. If blood is submitted already dried on a “card”, this should be indicated on submission paperwork. Samples considered evidence (e.g. bullets) must be in a separate package and listed on submission paperwork.

CT (Closed Temporarily) Letters:

If necessary known standards are not submitted with the evidence, a letter requesting the appropriate known standard(s) may be sent to the submitting agency. The evidence will be stored at SLED for approximately 3 months. If after 3 months, no standard has been received or no additional requests have been made, the evidence will be returned to the submitting agency.

If case circumstances change and/or requested standard(s) cannot be obtained, contact the DNA Casework Department to discuss options for testing prior to submission of the standard(s).

If requested known standards are obtained and submitted within 3 months, the case will automatically be placed back into the queue to be worked.

If standards are obtained after the evidence has been returned, the evidence should be resubmitted when the standard is submitted.

**After a letter requesting standards has been issued, if additional evidence is submitted and no standards have been received and there has been no response or communication regarding the previously issued letter, the new assignment will be administratively closed and the additional evidence returned without analysis.**

Submission of known standards for comparison to previously reported profiles or in response to a CODIS hit:

When a known standard is being submitted for comparison to a previously reported profile suitable for comparison or a CODIS hit, *do not* resubmit the previously analyzed evidence unless specifically requested to do so. Generally, comparisons between a previously reported DNA profile and the known standard can be performed without reanalysis of the evidence.

Comparisons using standards submitted in one case to evidence in another case:

A request to compare a known standard from one case to evidence in another case that has not previously been indicated as related will require a written request on the part of the submitting agency or the Solicitor's office. A request noted on laboratory submission paperwork or an email from the agency or Solicitor's office will suffice.

Except for submissions of autopsy samples from Coroners and relationship testing cases (see Criminal Parentage cases in a later section), known standards generally will not be accepted without accompanying evidence unless prior arrangements have been made with the DNA Casework Department. When a known standard is submitted for comparison to multiple cases, the standard should be submitted under one of the cases and all related cases appropriately noted on submission forms.

**Preferred Samples and Collection of Known Standards:**

Buccal swabs are the preferred sample for known standards, but liquid blood collected in a lavender-stoppered tube (containing EDTA), or a small amount of blood spotted on FTA® paper and allowed to dry are also acceptable. Blood spotted on FTA® is the preferred sample from autopsies.

Buccal swabs are collected by firmly rubbing 1 - 2 sterile regular swabs on the inside of the cheek to collect skin cells. When collecting these swabs, roll the swab around to ensure sample is present on all sides. After collection, allow swabs to dry thoroughly. These swabs may be packaged together and should be submitted as one item.

NOTE: Please avoid the use of foam swabs – please use sterile cotton swabs for collection of buccal swabs.

### **Elimination Standards:**

Known standards from persons whose DNA would be expected to be present on an item of evidence (and the presence of that DNA is not probative) should be submitted as elimination standards. Elimination standards from individuals who may have had contact with evidence items independent of the crime are needed to ensure only profiles from putative perpetrators are entered into CODIS. For example in a sexual assault case, if recent consensual sex (within 1 week) is indicated, a known sample from the consenting partner should be submitted. Another example would be the owner of an item when the only probative profile would be from the suspect, such as a stolen vehicle involved in a violent crime.

In many cases, an elimination standard is required for entry of a profile into CODIS. False exclusions may occur when a DNA profile is developed from evidence that does not match the suspect if we are unable to determine that the source of the profile is not related to the crime. For that reason, in some cases analysis will not proceed unless elimination standards have been submitted.

If an evidence collector feels they have inadvertently contaminated an item of evidence, they should collect a buccal swab and submit it to the lab for elimination purposes. SLED's DNA Casework Department maintains staff profiles from both SLED personnel and personnel from outside agencies and contractors for the purpose of contamination checks. **We strongly encourage all personnel whose job duties include the collection of evidence to submit a standard (buccal swab).** These standards usually should not be submitted as part of the case. Generally, simply notifying intake personnel that you have a standard from a collector will be sufficient. They will notify the DNA Casework Department to pick it up. Agencies who would like to provide SLED with standards from multiple personnel who collect evidence should contact the DNA Casework Department to coordinate this submission. Samples should be labeled with the name of the officer and the name of the agency for which they work.

### **Bones / Remains:**

Submitters should contact us prior to submission of bones or remains, as the condition of the remains may affect which samples should be submitted. Generally, for decomposed bodies, the preferred options for known standards include intact molars with no fillings (removed from the jawbone), or the longer bones from the hands or feet. **These samples should be stored frozen.**

It is imperative that tools used to collect these samples are clean, as mixed DNA profiles can result from samples collected using tools that have not been decontaminated. Mixed profiles from known standards render the standard useless for comparison purposes.

Samples preserved in formaldehyde (formalin) are generally unsuitable for DNA. If the remains are very old and/or dried out, analysis may be referred to a laboratory that specializes in analysis of these type samples.

### **Alternate Known Standards:**

If a known standard cannot be obtained, an alternate known standard may be submitted. Items that can *definitively* be attributed to the person can be used as an alternate known standard. Typically, these are items an officer witnessed the suspect discard and then promptly collected (e.g. bandages removed from suspect, cigarette butt or drink bottle discarded by subject, etc.). Items of clothing often yield mixtures and are not generally acceptable as an alternate known standard. When an alternate known standard is used for comparison, results will typically be reported as: "If the profile developed from item 1 is from John Smith, then ..."

Alternate known standards should be submitted in missing person cases when possible. Items should be established as positively as possible as belonging to the missing person. This can usually be accomplished by having a family member or roommate confirm the item as belonging to and being used exclusively by the missing individual. Additionally, if one is available, a known sample from a close biological relative (a child or parent) is also encouraged to ensure that the profile developed from the item is likely the profile of the missing person. Toothbrushes and razors are examples of items commonly submitted in missing person cases.

### **Entry of Evidence Profiles into CODIS:**

Per FBI guidelines, in order for a profile from evidence to qualify for entry into CODIS, it must meet the following criteria:

- a) There must be sufficient documentation that a crime was committed.
- b) The profile must contain the required amount of genetic information for CODIS entry.
- c) The profile must be from a probative piece of evidence in the case for which it is being entered and must be believed to contain DNA attributable to the suspect.
- d) The profile cannot be a complex mixture.

Regardless of whether or not the suspect is known or unknown, any profile generated from evidence that meets the above criteria will be entered into CODIS.

**It is imperative that sufficient information regarding the origin of evidence items be provided so that a determination regarding CODIS eligibility can be made for any**

**profiles developed. In the absence of sufficient information, the profile will not be entered into CODIS.**

Qualifying profiles will be entered into CODIS in accordance with state and national regulations, and regular searches will be performed. *Once entered, profiles remain in CODIS and are not removed unless additional information is developed that indicates it is not a qualifying profile.* A notification will be issued if there is a hit in the database or if the profile is removed from CODIS.

Profiles from victims, witnesses, or bystanders, as well as profiles from evidence that is not directly associated with a crime are not eligible for entry into CODIS.

**NOTE:** DNA profiles developed from evidence likely to contain the suspect's profile that was removed from the suspect's person, home, car, or any location where they would normally be may not be entered into CODIS to determine if any DNA present belongs to the suspect. We often receive requests to perform DNA on a firearm found in the possession of a felon. If the only charge will be related to the possession of a firearm by a felon, we cannot enter these profiles into CODIS.

**NOTE:** For legal reasons, we cannot report a statistical match between evidence and an offender or arrestee profile in CODIS. Additionally, we cannot look up an offender or arrestee profile and perform a manual comparison to an evidence profile to determine if the person of interest is included or not.

Entry of a profile into CODIS may result in a hit to a previously convicted offender (Offender hit), an evidentiary profile from another case (Forensic hit), or an arrestee (Arrestee hit). If an Offender or Arrestee hit is generated by CODIS, a known standard from the individual identified by the hit report is required in order for DNA Casework to report a match between that person and the evidence in question.

**Hairs:**

DNA testing may be performed on hair if specific criteria are met. If probative forensic results are obtained from body fluids on evidentiary samples, DNA testing on hair may not be performed.

**Urine:**

The SLED DNA Casework Department does not perform testing for identification of urine; and urine is not a suitable sample for DNA analysis, as it typically contains little to no cellular material (which is the source of DNA); therefore, urine samples or swabs collected from a urine stain will not be accepted for DNA analysis.

**Fetal Tissue/Fetus:**

Fetal tissue or a fetus must be taken to a pathology lab for cellular differentiation and/or collection of fetal tissue prior to submission. Contact the DNA Casework Department prior to submission.

**M-Vac Collections:**

For M-Vac collections performed by the submitting agency, the filter must be separated from the apparatus, and only the filter submitted. It should be packaged appropriately, and labeled with the following: the location the sample was collected from, date and time of collection, and the identity of the collector.

Generally, sample collection using the M-Vac will not be performed unless case circumstances indicate such a collection will be beneficial and the evidence item is suitable for this collection technique.

**Submission of a single case to multiple DNA labs:**

Once a case has been submitted to any DNA lab for analysis, we strongly urge that any subsequent DNA testing be performed by the same lab. There are both technical and prosecutorial concerns that must be considered when testing is performed by more than one lab. If you are considering submitting a case where items in that case have been tested elsewhere, you must contact us prior to submission. The only exceptions would be instances where specialized testing such as mitochondrial DNA analysis was performed by another lab.

SLED DNA Casework will perform Y-STR testing for cases submitted elsewhere where the original lab does not perform this analysis. This should be coordinated with the DNA Technical Leader prior to submission.

**Case Analysis Information:**

DNA testing will be considered complete when an association between a suspect and victim or a subject and a crime scene is established from probative evidence.

Samples where the source is known and testing will not answer any question related to the case will not routinely be tested.

If submitted items or testing requests will not add valuable information to the questions presented by the case, or if the facts of the case do not reasonably support the testing request, it will not be analyzed. Some examples of this may be analysis of a suspect's bed sheets in a sexual assault case, or a cigarette butt collected in a public area when there is no corroborating information that it is related to the crime. Another example is the processing of suspect's clothing for victim's blood in a drive-by shooting. Additionally, if a suspect and victim live together, proving the suspect was at the scene is typically of no value since it cannot be determined when the DNA was deposited. The location from which the sample was collected may also need to be considered when determining probative value.



Generally, DNA testing is not necessary for suicides; however, in cases involving questionable circumstances it may be indicated.

For multiple samples collected from a single item of evidence or from a crime scene, initial testing will be limited to a representative sample, unless circumstances of the case dictate otherwise.

### **Analysis Requests:**

When pre-logging a case into iLAB prior to submission to the laboratory for DNA analysis, careful consideration of the *analysis request* for each item is strongly encouraged as this is vital information for the examiner. Contact us if you are unsure which request(s) to choose.

The available requests and a brief explanation of the proper usage of each are listed below (occasionally, more than one request will be appropriate on an individual item):

- DNA-Known Standard: Item is a known sample collected from a victim, suspect, or for elimination purposes. Always indicate the full name of the person from whom it was collected in the item description. This request will apply whether the known standard is a buccal swab or a tube of blood. A buccal swab is preferred.
- DNA-Alternate Known Standard: For use when a known standard is not available. The item must be known to have been used solely by the person in question. May be applicable in cases where suspect won't consent to collection of a standard, or in cases where confirmation of identity for human remains is requested. A personal item known to be used by the deceased submitted as an alternate known standard can be compared to unidentified remains to determine probable identity. An alternate known standard that results in a mixture may not be suitable for use as a comparison standard. Typically, the DNA Casework Department should be contacted prior to use of this request.
- DNA-Blood: Evidence item has suspected blood stain(s) on it.
- DNA-Semen: Evidence item has suspected semen stain(s) on it.
- DNA-Saliva: Evidence item likely contains saliva left behind by the user. This request is typically used for cigarette butts, chewed gum, drink bottles or cans, straws, or any area or item that a person would have licked or placed in their mouth.
- DNA-Touch: Evidence item was handled by or came into contact with the suspect or victim in such a way that it is likely that their DNA may have been deposited.
- DNA-Hair: Item is a hair or hairs submitted for DNA testing.

- DNA-Ownership: Evidence item was likely worn repeatedly or most recently by a person involved in the case (sometimes termed “wearer DNA”). This request will typically apply to clothing.
- DNA-Fingernails: Item is fingernails.
- DNA-Other: Item does not clearly fit into another category. Typical examples are bones from unidentified remains. Clarification should be added in the comments section of the submission packing slip when this request is used.
- DNA-Paternity: Paternity/Relationship/Identification – For the submission of known standards or products of conception (fetal tissue) when parentage needs to be determined or identification of human remains is needed. For cases with unidentified human remains, this request should only be used for the actual remains and known standards from parents or children used for comparison. For personal items used by the deceased submitted for comparison to remains to determine identity, “Alternate Known Standard” should be requested.

***Good communication between the forensic scientist and the evidence submitter is strongly encouraged.***

### **Evidence Submission Guidelines by Case Type:**

For all case types, known reference standards from the victim(s), suspect(s), or those submitted for elimination purposes are not counted against the number of items that may be submitted.

### **Sexual Assaults**

- All submitted Sexual Assault Evidence Collection Kits will be accepted and tested, regardless of whether the suspect is known or unknown, or a suspect standard is submitted or not. We do encourage submission of a standard from the suspect with the initial submission if they are known and the standard can be obtained.
- We do require a known standard from the victim. This is necessary to determine what information in any profiles developed may be attributed to the suspect.
- Adequate case information must be provided for testing to proceed. The Sexual Assault Protocol (SANE report) is required for analysis of a sexual assault kit. All instructions and required paperwork for these kits may be found on our website at [www.sled.sc.gov](http://www.sled.sc.gov) in the Forensics section.
- The first submission is limited to the sexual assault kit and one pair of underwear.
- If no DNA profile foreign to the victim is developed from the kit, additional items such as clothing or bed linens may be submitted in a subsequent submission - limited to 5 items per submission.

- If a DNA profile matching the subject or a DNA profile eligible for CODIS is developed, no additional items will be examined unless circumstances (such as multiple perpetrators) suggest the need for additional testing.
- Clothing belonging to the suspect will not be examined unless there is reason to believe the victim's blood may be present on the clothing and no association has been made with analysis of the sexual assault kit.

### **Homicides/Violent Crimes (robbery, assault, etc.)**

- Evidence is limited to 5 evidence items per submission.
- If probative DNA profiles are obtained, no additional items will be examined, unless special circumstances indicate the need for processing additional items.
- If no probative DNA profiles are developed on the first submission, 5 additional items may be submitted for processing.
- If case circumstances indicate that more than 5 items of evidence be submitted, the submitter must call the SLED DNA lab prior to submission.

### **Burglary/Property Crimes**

- First submission is limited to 2 items - typically blood sample(s) from the scene, or items left at the crime scene by the perpetrator (e.g. cigarette butt, item of clothing, drink container) will be accepted. Touch DNA on property crimes will not be accepted.
- If a DNA profile matching the subject or a DNA profile eligible for CODIS is developed from at least one item, no additional items will be examined, unless circumstances (e.g. multiple perpetrators) suggest the need for additional analysis.

### **Criminal Parentage Cases**

- When necessary, parentage testing can be done in cases of sexual assault. In cases where the questioned father cannot be excluded as a possible biological father of the child, paternity statistics will be reported.

Submissions must include all of the following:

- a) known standard from the mother or alleged mother
- b) known standard from the father or alleged father
- c) known standard from the child

We can also perform reverse parentage analysis and identify a child as the possible offspring of two individuals. Cases that involve an abandoned baby or a missing person are examples of situations where this testing may be useful.

If all three required standards are not available, arrangements for statistical analysis by an outside lab must be completed prior to initiating testing.

Identification of Human Remains: Testing done to establish similar relationships in other type cases is not always subject to the same requirements. When assistance is

needed with identification of human remains and an alternate known standard or one or both parental standards are not available, some exceptions to relationship testing submission requirements may be made. If this testing is needed, contact the SLED DNA Casework Department prior to submission.

### Missing Persons Cases

- In the case of missing persons, known standards from relatives may be submitted for entry into the Missing Persons Database. There are specific requirements of the submitting agency for these submissions. Contact the DNA Casework Department prior to submission.

### “Touch DNA” Evidence

- “Touch” or “contact” DNA evidence is evidence which has no visible staining and would contain DNA that results from an item being touched or handled. *Touch DNA evidence can sometimes provide useful information, but very often yields profiles that have little or no value.* Touch evidence does not include cigarette butts, swabbing from cans, bottles, straws, envelopes or other items in which the substance being tested for is most likely saliva. Touch evidence also does not include items submitted for wearer (ownership) such as shirts, shoes, hats, gloves, mask etc. where a probability of prolonged contact is suspected.
- Touch evidence will be accepted for possible DNA analysis only when there is a high degree of probability that the evidence will provide results or investigative leads. A high degree of probability may be established by witness corroboration, visual monitoring systems, or sound deductive reasoning.
- **Touch evidence will only be accepted for violent crimes.**
- Touch evidence will be processed only when no other probative evidence exists.
- The number of items submitted for touch DNA analysis will comply with the number of items that may be submitted based on case type. (For example: aggravated assault - 5 items)
- Elimination standards must be submitted when appropriate.

## III. SPECIAL CONSIDERATIONS

The following are some limitations of DNA analysis:

1. The age of a dried blood or semen stain cannot be determined with the analysis performed by the SLED DNA Casework Department at this time. The forensic scientist may sometimes be able to use his or her experience to offer an opinion in court regarding age (e.g., a blood stain that appears to have been washed multiple times or a drop of blood on a floor that was very dark brown and difficult to remove may not have been deposited recently), but cannot state the age of a stain with any scientific certainty.
2. The race of the source of the DNA cannot be determined using current DNA technology performed at SLED.

3. The identification of semen and subsequent development of a DNA profile does not indicate whether intercourse was consensual or forced.

**If it is determined that DNA analysis is no longer needed on a case, notify the DNA Casework Department as soon as possible.**

#### **IV. REPORT INTERPRETATION**

Both sections of the DNA Casework Department (see introduction) may generate independent reports. Serology reports may incorporate evidence processing results; and a DNA report may incorporate Serology results.

The top of the report will contain the report date, agency identification information, SLED and agency case numbers, incident date, and victim and subject names.

STRmix™ is a software program developed and utilized for the interpretation of low level and complex mixtures of DNA. The implementation of STRmix™ for statistical analysis of DNA comparisons has allowed for the interpretation of many profiles that would have previously been uninterpretable using former methods. The format and wording of DNA results has changed to reflect statistical reporting using STRmix™, so please do not hesitate to call for clarification of DNA results, if necessary.

## DNA DATABASE DEPARTMENT

---

### COMBINED DNA INDEX SYSTEM (CODIS)

#### I. CAPABILITIES AND SERVICES

The DNA Database Department manages the COMbined DNA Index System (CODIS) which is a nationwide database containing the DNA profiles of criminal offenders, crime scene evidence, missing persons and their relatives. South Carolina Law Enforcement Division (SLED) is the state repository for offender (both convicted offender and arrestee) DNA specimens required per S.C. Code Ann. § 23-3-620.

Profiles developed from these samples are for databasing purposes only. A direct comparison cannot be performed between profiles developed from these samples and evidence profiles. If direct comparison is needed, a standard with a proper chain of custody and collected using appropriate legal authority should be obtained and submitted to the laboratory that will be performing the DNA analysis on the evidence to which comparison is requested.

DNA sample collection of qualifying offenders is a responsibility shared by multiple agencies. Once collected, database samples must be submitted to SLED. Upon receipt, the DNA samples are processed and analyzed. The results of these analyses are entered into the CODIS database. The offender profiles are searched against other profiles in the CODIS database with the intent to provide investigative leads to unresolved cases.

In the event of a hit, or match between crime scene evidence and a qualifying offender sample, the results will be reported to the agency that submitted the crime scene sample. This provides an investigative lead for the agency and, depending on the probative value of the evidence, can provide probable cause for an arrest. If an offender is arrested for a crime based on a CODIS hit, another known standard must be collected from that individual with a documented chain of custody for court purposes. This standard is then examined by the crime laboratory that analyzed the crime scene evidence. The crime laboratory will issue a DNA report including the results of the comparison and statistics.

Samples from qualifying offenders are not considered evidence and are not treated as evidence. SLED will retain qualifying offender samples indefinitely to aid both future and past investigations. This also provides the ability to reanalyze samples as new technologies are developed.

CODIS searches can also result in a forensic hit, where the DNA profile developed from evidence in one case hits against the DNA profile developed from evidence in another case. This provides an investigative lead that enables multiple jurisdictions to coordinate their investigation efforts.

DNA technology can also be used as an aid to locate missing persons and identify human remains. DNA profiles of unidentified persons are compared to DNA profiles contained within the State DNA Database, including biological relatives of missing persons. Unidentified person refers to the recovered deceased (including body parts) or an individual who is unidentified (individuals who can't or refuse to identify themselves).

For Missing Persons cases, items used exclusively by the missing person (i.e. toothbrush, razor) and known standards from biological relatives of the missing person should be submitted for inclusion in CODIS. First degree relatives are preferred (parents, siblings, offspring), but further removed relatives are acceptable. A consent form must be signed by each relative who submits a known standard. This form is available from the DNA Database or DNA Casework Department. The profiles from relatives of missing persons are only searched against unidentified persons and are not searched against crime scene evidence.

STR, Y-STR and mitochondrial DNA analysis will be performed as appropriate. Standards collected from relatives of missing persons may be outsourced to a CODIS participating laboratory for STR, Y-STR and/or mitochondrial DNA analysis.

Offender DNA records are subject to expungement from the State DNA Database if appropriate documentation is received from the Solicitor's Office with jurisdiction over the qualifying DNA offense and the offender meets the eligibility requirements as described in S.C. Code Ann. § 23-3-660.

## **II. DATABASE SAMPLE COLLECTION, PACKAGING, AND SUBMISSION PROCEDURES**

The DNA Database Department provides all supplies necessary for collection of offender samples to the agency with offender jurisdiction free of charge. The supplies are contained in either a buccal or fingerstick collection kit. Collection and submission procedures are included. The kits are for collection of qualifying offender specimen only. Do not use the kit to collect evidence such as suspect, victim, or elimination standards in on-going investigations. Agencies may order the kits by telephone, fax, or email.

Sample submissions to SLED and obtaining/maintaining an adequate amount of supplies are the responsibilities of each collection agency. Offender samples may be mailed, using a DNA Collection Kit, or hand delivered to SLED's Forensic Services Laboratory. Liquid blood samples should be collected in a lavender top tube. Blood or saliva samples preserved on FTA cards and buccal specimens collected using sterile swabs are also acceptable. If the submission was not pre-logged, the SLED DNA Database Collection Card must accompany the sample.

When collecting a qualifying offender specimen, all available information must be included on the collection card before shipping to SLED's DNA Database Department. Failure to include crucial information or fingerprints, or poor sample collection could prevent the sample from being entered into the State DNA Database.

Prior to collecting a DNA sample from an offender, the individual collecting the sample must verify that the offense for which the offender was arrested or convicted is a qualifying offense according to S.C. Code Ann. § 23-3-620 and that the offender does not already have a sample included in the State DNA Database. To determine if a biological specimen from an offender already exists in the State DNA Database, access to SLED's iLAB system is needed. Contact the SLED's DNA Database or Forensic Technology Department for access to iLAB.

### **III. SPECIAL CONSIDERATIONS**

#### **S.C. Statutes**

State Deoxyribonucleic Acid (DNA) Identification Record Database (State DNA Database), <http://www.scstatehouse.net/code/t23c003.doc>, Title 23, Chapter 3, Article 9, 23-3-600 – 23-3-700

#### **Code of Regulations**

Chapter 73, Article 5, 73-61 <http://www.scstatehouse.net/coderegs/c073.doc>

### **IV. MATCH CONFIRMATION LETTER INTERPRETATION**

When a CODIS hit is returned to a case, the agency that submitted the crime scene evidence is notified by letter that a forensic hit (case to case), an offender/arrestee hit (evidence to a convicted offender or arrestee) or a missing person hit (offender or relative of missing person to an unidentified person) has occurred. The agency is given investigating agency contact information and/or offender information. The information provided is for investigative purposes only. If a suspect is apprehended, a known standard with a documented chain of custody must be submitted for court purposes.

If the offender listed in an offender hit letter is excluded as a suspect during the investigation (i.e. determined to be a witness, consensual partner of a sexual assault victim, etc.), notify the DNA Database Department so that the evidence profile associated with the listed offender can be removed from CODIS. The FBI dictates that only DNA profiles developed from evidence items that are attributable to the putative perpetrator can be entered into the national database.



## DRUG ANALYSIS DEPARTMENT

---

### I. CAPABILITIES AND SERVICES

The Drug Analysis Department is responsible for the analysis of evidentiary items to establish the presence, identity and quantity of controlled substances. In cases involving the possession, distribution, and manufacture of controlled substances, laboratory analysis is often a major element of the case. Chemical spot tests, published reference materials, and/or microscopic analyses may be used as indicative or screening tests. These tests are performed prior to confirmatory testing through scientific instrumentation. The department has a wide array of instrumentation including: Gas Chromatograph/Mass Spectrometer (GC/MS) and Fourier Transform Infrared Spectrometer (FTIR). These types of instrumentation are utilized for confirmatory testing prior to the issuance of a laboratory report. The Drug Analysis Department conducts quantitative analysis of tetrahydrocannabinol (THC) in plant material to distinguish between marijuana and industrial hemp.

The Drug Analysis Department conducts analysis on non-biological submissions only. The analysis of biological samples such as bodily fluids or tissue samples for controlled substances is performed by the Toxicology Department.

The Drug Analysis Department provides:

- Qualitative analysis to determine the presence, identity and aggregate quantity or absence of controlled substances
- Clandestine laboratory sample analysis
- Quantitative analysis of THC in cannabis and cannabis products
- Expert witness courtroom testimony in the field of Forensic Drug Analysis

Various South Carolina statutes and regulations impact this department's work. Drug Analysis reports reflect the proper controlled substance scheduling under applicable South Carolina and/or Federal statutes. The duties of SLED in matters related to controlled substances are detailed in Section 44-53-120, 1976 South Carolina Code of Laws, as amended. Regulations 73-70 through 73-150 of the South Carolina Code of Regulations sets forth regulations concerning the uniform procedures for the handling of controlled substances. Rule 6 (Rule for Chemical Analysis and Chain of Custody) of the South Carolina Rules of Criminal Procedure also impacts this department. If the requirements of Rule 6 are met, a laboratory report concerning controlled substances may be accepted in court without the presence of the chemist.

### II. EVIDENCE COLLECTION, PACKAGING, AND SUBMISSION PROCEDURES

### *Evidence Collection and Packaging*

1. All evidence should be dry prior to final packaging and submission to the laboratory for analysis.
  - a. Fresh plant material/hallucinogenic mushrooms should be air dried and sealed with evidence tape in a paper container prior to being submitted to the laboratory. Wet plant material results in moldy or decomposed evidence which is usually not analyzed.
  - b. Submissions containing whole plants suspected to be cannabis, which are to be treated as separate plants during analysis, should be packaged and labeled separately to prevent cross-contamination between plants. Samples should be a minimum of 1 gram and be taken from bud if available. If needed, any additional sample should come from the leaves.
  - c. In cases involving seizures of less than 100 plants, all plants should be photographically documented. If the charge is to be based on total weight, the leaves and buds from each plant should be removed from the stalks and packaged separately to prevent cross-contamination. If the charge is to be based on the number of plants, only a sample from each plant is required, as described in section b.
  - d. In cases involving 100 plants or more, all plants should be photographically documented. Once documentation is completed, a representative sample from each plant should be taken and packaged separately to prevent cross-contamination. This type of case will be based on the number of plants.
2. Some cannabis products may not be suitable for quantitation. Contact the department if unsure. Samples which are not suitable for quantitation will not be analyzed for the presence of THC unless there is no other controlled substance within the case. Exceptions may be made on a case by case basis.
3. In cases involving multiple subjects and multiple items, if certain items were actually seized from a specific individual or location – the item’s container should be marked with the name of the subject or location and further notated in the item’s description during iLAB pre-log.
4. All packaging must prevent evidentiary leakage and be tamper evident. SLED provides B.E.S.T. (Best Evidence Sample Testing) kits for small item cases. Paper bags, boxes and manila envelopes that are used for larger items must be properly sealed using evidence tape and including the initials of the individual sealing the container along with the date.
5. Evidence items of a fragile nature (e.g. glass jars) must be appropriately packaged or wrapped to avoid breakage.
6. All drug evidence which may have come in contact with biologically hazardous material should be marked with a biohazard sticker and the nature of the suspected biohazard should be indicated. This biohazard notation should also be made on the item of evidence and be further notated in the comment section during iLAB pre-log. The drug chemist, in conjunction with the drug analysis supervisor, will determine what analyses, if any, are possible.

7. Field test kits contain chemicals that may compromise the integrity of the packaging and of the controlled substances and should not be submitted/packaged with the evidence.
8. Only a representative sample of liquid seized from clandestine laboratories will be accepted for analysis. These samples must be first placed in individual sealed glass vials which are then further secured in individual sealed plastic bottles and then ultimately secured in sealed plastic bags to prevent leakage. The large, original containers from the site should not be submitted to the laboratory.
9. The SLED Drug Analysis Request Form with B.E.S.T. submissions or iLAB Packing Slip (or a SLED Forensic Services Request form and a SLED Evidence Inventory form) with non-B.E.S.T. submissions should be completed prior to submission.
10. Complete Chain of Custody Form or your agency approved departmental chain of custody forms prior to submission.

#### *Evidence Submission Procedures*

1. All evidence should be submitted for analysis as soon as practical.
2. Cases should **not** be submitted to the SLED Drug Analysis Department for analysis when any one of the following circumstances exists:
  - a. The case has already been disposed of within the proper judicial channels.
  - b. There is no defendant associated with the evidence.
  - c. The evidence is not **properly sealed**.
3. Drug evidence must be submitted in person. It will not be accepted through the mail.
4. List all submitted items separately on the SLED Drug Analysis Request Form.
5. Because of the risk associated with their analysis, sharp items such as razor blades should not be submitted to the Drug Analysis Department.
6. Liquids from hypodermic syringes will be accepted for analysis. Liquids from syringes which contain body fluids should be submitted to the Toxicology Department only after consultation with personnel in that department.
7. Syringes will be accepted by the Drug Analysis Department only if **all** of the following criteria are met:
  - a. The syringe is the only evidence in the case.
  - b. Needles are removed or properly capped.
  - c. The syringe does not contain blood or any other biological fluids.
  - d. The syringe is packaged in a safety container.
  - e. No liquid can be removed from the syringe for submission and a “wash” to check for residue is required.
8. Minor discrepancies recorded in the evidence inventory will be corrected by the Forensic Scientist and verified by another member of the department and denoted by his or her initials upon examination of the evidence and reflected on the Drug Analysis Request form included in the case documents. Evidence as it was found by the SLED analyst will be reflected on the official report. In cases where there are major discrepancies recorded in the evidence inventory, contact will be made with the submitting case officer.

9. Call the SLED Drug Analysis Department prior to submitting evidence from clandestine laboratory seizures, in order to get guidance on what will be accepted for analysis, as well as the quantity (of liquids) required.
10. Requests for latent print analysis on items of drug evidence must be added during iLAB pre-log. It is also recommended that the latent print request be indicated on the packaging. Proper procedures for submitting latent evidence should be followed. The drug evidence will be removed from the original packaging for analysis and the packaging will be routed to the Latent Print Department for latent print processing.
11. Only drugs which substantiate the highest penalty for each schedule will be analyzed per the SLED B.E.S.T. evidence sampling plan. Based on the nature of the submission, a statistically based or weight threshold based sampling plan may be implemented if necessary.
12. In cases which contain simple possession level of suspected marijuana and any other controlled substance, analysis of the cannabis will not routinely be performed.
13. Routine analysis of suspected controlled substances consists of a determination of the controlled substance and weight of the controlled substance as dictated by statute. Any other requests should be made to the drug analysis supervisor for consideration.

### **III. SPECIAL CONSIDERATIONS**

SLED uses a drug testing system called-BEST EVIDENCE SAMPLE TESTING (B.E.S.T.). The B.E.S.T. system incorporates the most innovative evidence handling and drug testing techniques available.

The B.E.S.T. system was designed to deal with the majority of cases which carry possession and possession with intent to distribute (PWID) charges, but may also be used in trafficking cases. Per departmental protocol, additional analysis may be required in addition to B.E.S.T. practices.

The evidence submitted in each drug case will be carefully examined, counted and weighed, but only enough drug evidence to prove the best (highest) charge may receive a confirmatory analysis. The B.E.S.T. protocol is not a sampling system whereby a small number of samples are tested and the results inferred for the whole case. Sufficient samples by weight or dosage units are tested to prove the highest penalty for each schedule and or substance. The remaining samples are weighed and indicatively tested as appropriate, but not confirmed. If there is a need to analyze all items of evidence submitted, the submitter can request that this be done on a case-by-case basis.

The SLED Drug Analysis Department does utilize a statistically based sampling plan when certain conditions are met. When this plan is used in testing, the result will reflect the portion of the sample tested and the amount of remaining untested material.

**DO**

- Read the directions on the front of the B.E.S.T. manila envelope. Call the SLED Drug Analysis Department if there are any questions.
- Compare the control number on the plastic security envelope to the number on the manila envelope. If these two numbers do not match DO NOT USE THE B.E.S.T. KIT. Mark these “VOID” and return them to SLED.
- Use ball point (indelible) pen.
- Securely seal the containers of suspected drugs placed inside the plastic security envelopes. Evidence should never be loose within the plastic security envelope.
- Separate evidence according to the subject if it is possible to do so. Use separate security envelopes for multiple subjects when possible.
- Keep all evidence and custody forms together in the manila envelope.
- Place the back manila copy of the Drug Analysis Request form inside the plastic security envelope, positioned so that the analyst can read the form without breaking the seal of the envelope.
- Remove the adhesive strip liner before attempting to seal the blue plastic security envelope. Once the envelope is sealed, be sure to sign and date the envelope where indicated.
- Return any damaged or defective plastic security envelopes to SLED (DO NOT USE THEM TO SUBMIT EVIDENCE FOR ANALYSIS).
- Thoroughly mark and initial all items of drug evidence before placing them in the plastic security envelope.
- Dry all drug evidence prior to placing in the plastic security envelope. Not doing so may result in moldy material.
- Compare the evidence placed in the plastic security envelope with that listed on the Drug Analysis Request form and chain of custody forms.
- Keep track of the control numbers.

**DO NOT**

- DO NOT place chain of custody forms INSIDE the plastic security envelope.
- DO NOT use B.E.S.T. kit if the control numbers do not match on the manila envelope and the plastic security envelope. Mark these “VOID” and return them to SLED.
- DO NOT submit wet powders, wet tablets or other wet suspect materials in a B.E.S.T. kit.
- DO NOT submit hypodermic syringes in the plastic security envelope. If syringes need to be submitted, use a plastic safety tube designed for this purpose.
- DO NOT submit paraphernalia, extraneous non-evidentiary items, or sharp objects unless absolutely essential to the case.
- DO NOT submit latent print evidence in the plastic security envelope along with the drug evidence if only latent prints analysis is needed. If possible, separate items going to Drug Analysis and Latent Prints.
- DO NOT place hot items in the plastic security envelope. Allow to cool first.

- DO NOT overstuff the plastic security envelope. Use more than one if necessary or submit by non-BEST packaging.
- DO NOT destroy a damaged plastic security envelope. Return to SLED.

#### **IV. REPORT INTERPRETATION**

- The reported weight obtained and recorded on the official SLED Report is the only weight recognized by the Drug Analysis Department.
- A forensic scientist may occasionally report a controlled substance as “found, no weight obtained”. This means that a controlled substance was confirmed but it was not feasible to take and/or report a weight for the item.
- A forensic scientist may occasionally report that no analysis was performed on an item of evidence. The following circumstances may result in this outcome.
  - There were other items analyzed in the case which the forensic scientist deemed the best items of evidence in the case.
  - The quality of the evidence was low (such as moldy plant material, etc.).
  - The evidence was biohazardous in nature (razor blade, needle, sharp items, etc.).
- If the submitting agency receives a report on an item in which no analysis was performed and there is a question as to the reason, contact the supervisor of the Drug Analysis Department.
- Reports stating that a substance is found will normally be followed by a schedule (classification) for that substance in accordance to the Controlled Substances Act or other applicable classification. The following is a list of frequently used classifications and their interpretations:
  - C-I (Schedule I substance)
  - C-II (Schedule II substance)
  - C-III (Schedule III substance)
  - C-IV (Schedule IV substance)
  - C-V (Schedule V substance)
  - RX (Prescription substance)
  - OTC (Over The Counter substance)
- Reports that state a substance is indicated will normally be used to denote pharmaceutical preparations which are identified through comparisons with reference literature or markings on containers but are not actually analyzed. This notation will also be used to denote substances which were not analyzed using confirmatory instrumentation or where compounds were analyzed and no standard was used for confirmation.

#### **V. DESTRUCTION OF EVIDENCE**

Drug evidence may be submitted to the South Carolina Law Enforcement Division (SLED), Drug Analysis Department for destruction by incineration using one of the following two procedures:

**A.** For submissions containing no more than five boxes (maximum size of 24inx24in, ideally the size of a paper ream box) and/or no more than 200 pounds total weight:

- Evidence will be logged in as a “Drugs for Destruction” case.
- A separate inventory sheet is required for **EACH** container being submitted. The inventory should adequately identify the contents of the container and it is highly recommended that it contain the submitting agency case number and corresponding evidence for each case. **SLED Drug Analysis accepts any submissions for drug destruction on a “said to contain” basis. The more descriptive and specific the associated inventory sheets are, the more SLED can attest to should a question arise later. SLED WILL NOT PERFORM AN INVENTORY OF ANY SUBMITTED CASES FOR DESTRUCTION.**
- Once the evidence is submitted, the submitting officer must complete the required portions of the Authorization for Destruction form. Without proper completion of this form, SLED will not dispose of any part of the submission.
- The submission will remain in a queue for destruction until an internal drug burn is performed.
- Once the submission is destroyed, SLED will send a letter of destruction to the agency noting the date of destruction and assigned SLED lab number.

**B.** To request an appointment for drug destruction via incineration:

- For general questions or to schedule a date and time to perform the destruction call the department at 803.896.7355 or email [drugdestruction@sled.sc.gov](mailto:drugdestruction@sled.sc.gov).
- No paperwork will be required by SLED using this procedure. The submitting agency will be solely responsible for the inventory and custody of all evidence. There will be **NO TRANSFER OF CUSTODY**. A certified operator will be present only to operate the incinerator and dictate how the burn will proceed.
- Each burn cycle will destroy approximately 50 pounds of substance and takes approximately 30 minutes to complete, so plan accordingly and allow enough time to complete the burn.
- Submitting agency should plan to provide security and supervision for all evidence to be destroyed at all times. SLED will not be responsible for the security of the items and will not store the items at any time.

**What CAN be destroyed using the SLED incinerator:**

- Drug Evidence (Plant material, powders, etc.), associated paperwork, and non-metal immediate packaging

**What CANNOT be destroyed:**

- Anything other than drug evidence, associated paperwork, and non-metal immediate packaging including, but not limited to:
  - Metal, glass, or heavy plastic objects
  - Sharps such as syringes, needles, knives, scissors, etc.
  - Containers which may have contents under pressure
  - Containers containing liquid chemicals that may be combustible or highly flammable such as ethyl ether, gasoline or diesel, or other solvents.
  - LIVE OR SPENT AMMUNITION
  - Pharmaceutical Products (tablets, capsules, liquid bottles or syringes, etc.)
  - If any of the above items are contained within the immediate packaging with drug evidence, they **MUST** be removed prior to submission for incineration.



## EVIDENCE CONTROL DEPARTMENT

---

### I. CAPABILITIES AND SERVICES

The Evidence Control Department is responsible for the acceptance and storage of all evidence submitted to the Forensic Services Laboratory. Over 20,000 cases are received annually by the Evidence Control Department. In this section, Forensic Technicians retrieve evidence from the Evidence Submission Lockers and enter corresponding case information into the Laboratory Information Management System (LIMS). The evidence is barcoded and disseminated to the appropriate department for analysis. Upon completion of forensic analyses, the evidence remains secure in the evidence room until it is returned to the submitting agency or other authorized official.

The Evidence Control Department is responsible for the distribution of Evidence Collection Kits such as Sexual Assault Kits, Suspect Kits, Blood/Urine Collection Kits, B.E.S.T. Evidence Kits and GSR (Gun Shot Residue) Kits.

Evidence to be analyzed by the Computer Crime Center is submitted directly to the Computer Crime Center located in the SLED Annex at 1731 Bush River Road. Evidence such as DVD's to be enhanced is submitted directly to SLED Technical Services located at 4400 Broad River Road.

### II. EVIDENCE COLLECTION, PACKAGING AND SUBMISSION PROCEDURES

All sealed evidence packages received by the Evidence Control Department are assumed to contain what they are "said to contain" according to the submission paperwork. Evidence Control personnel do not conduct an inventory of the contents within these sealed evidence packages during the intake process. All evidence deposited into the lockers must be [pre-logged through iLAB](#).

Submission paperwork (iLAB Packing Slip, Incident Report, Drug Request Form/Chains) must not be sealed inside the evidence packaging, but should be affixed to the outside of the package using a paperclip or rubber band. Evidence Control personnel will not open sealed packages to remove paperwork. All packages are required to be labeled with the submitting agency name, submitting agency case number and a brief description of the items contained in the package. Adequate labeling of packaging is essential in order to associate the evidence to the appropriate iLAB Packing Slip.

Improperly sealed/packaged evidence or evidence submitted without proper/complete submission information on the Packing Slip is subject to return without analysis.

Submitting agencies should pre-package evidence in separate containers if they know in advance that the items will be routed to different departments. This commonly applies to evidence going to DNA and Toxicology. This procedure is also necessary when personal belongings are submitted as part of a case and have the potential to be returned to an agency/officer other than the initial submitting agency (i.e. Police Officer Involved Shootings). At the point of evidence return, Evidence Control Forensic Technicians have no authority to open containers for the purpose of returning select items within a single container.

Additional evidence submissions to a previously submitted case should be added as a new submission under the same case number in iLAB. If evidence is related to another case this should be clearly indicated in the case comments during iLAB pre-log. **If evidence is being re-submitted, keep all evidence in the original SLED packaging to facilitate accurate identification during the re-submission process.**

At the time of submission, specific packaging guidelines should be followed depending on the type of evidence and the department designated to receive the items. Boxes, heat sealable pouches, and envelopes are most commonly used to secure evidence. Boxes and envelopes containing evidence should be sealed with evidence tape and initialed and dated by the sealing official prior to submission to the laboratory for analysis. However, in instances where packaging is not suitable due to the size/type of evidence, the Evidence Control staff will contact a Forensic Scientist/Technician to receive the evidence immediately at the time of submission. Avoid the use of staples to secure evidence containers; staples are not considered a proper seal. It is also critical at the time of submission to alert the technician if any of the evidence is wet. Without proper packaging or drying procedures, the risk of destroying evidence is increased.

In order to ensure that all required analyses are completed, it is important that all examination requests be entered during pre-log. Coordination of these examination requests by the laboratory is necessary to prevent damage or loss of evidentiary value.

During the intake process, the Evidence Control Forensic Technician will do the following:

1. Review laboratory forms to verify submitting agency/officer, case information and examination requests
2. Enter all data into the Laboratory Information Management System (LIMS)
3. Scan all forms/documents presented/related to each case
4. Ensure evidence is properly sealed and initialed and dated by sealing official
5. Transfer evidence to the evidence room and/or to the appropriate Forensic Scientist/Technician
6. All submission paperwork will be available for pick up by the submitting agency following the completion of the intake process. Evidence receipts are available for download on iLAB.

### ***iLAB Submission Process and Procedures:***

The iLAB system was designed to allow law enforcement agencies to “pre-log” evidence prior to submission at the Forensic Services Laboratory. Access to iLAB is located on the SLED website ([www.sled.sc.gov](http://www.sled.sc.gov)). The submitting agency will access iLAB with the username and password provided to them by the Forensic Services Laboratory [LIMS Administrator](#). The LIMS Administrator sets forth the guidelines and procedures regarding iLAB and the LIMS system. Detailed iLAB tutorials are available on the SLED website. These tutorials provide an introduction to iLAB’s features, guidelines on how to use iLAB, and instructions on how to properly input the case information into the system (i.e. item descriptions and the requested analysis). When entering an item description in iLAB, only describe the specific item that is being submitted for analysis. *All comments or special considerations should be listed in the Comment section located on the Create Request Tab.*

When the submitting agency inputs the information into iLAB, a Packing Slip is generated detailing the case information, items of evidence, and analysis requested. **The evidence submitter (delivering officer) will print and sign the Packing Slip in the designated area.** The Packing Slip contains a barcode which the Evidence Control Forensic Technician will scan during the submission process. When this barcode is scanned, the information is populated into the LIMS system. The Evidence Control Forensic Technician will then verify that all information is correct in the LIMS system. If necessary, corrections will be made by the Forensic Technician in the LIMS system and also on the Packing Slip. All documents presented during the submission process are scanned into the electronic case file in LIMS. All original copies are returned to the evidence submitter. In addition to pre-logging evidence via iLAB, system users can check on case status, view current location/disposition of evidence, download evidence submission receipts and download completed reports.

### **III. SPECIAL CONSIDERATIONS**

The Evidence Control Department requests that all evidence submitters arrive at SLED no later than 4:30 P.M. to deposit evidence in the Evidence Submission Lockers.

The Evidence Control Department abides by the current Case Acceptance Guidelines for each forensics department.

The submission process can be expedited when the submitter has all documents accurately prepared at the time of arrival and has sufficient knowledge of the case(s) and/or item(s) being delivered.

In accordance with Evidence Control policy, Evidence Control Technicians will not sign a submitting agency’s Chain(s) of Custody. A receipt is generated at the time of

submission to document the transfer of evidence. This receipt includes the date and time the evidence was submitted, all pertinent case information, and the signature of the receiving Evidence Control Technician that accepted the evidence. The submission receipt is available on iLAB.

As each agency arrives to submit evidence for analysis, the Evidence Control staff will search the LIMS system for evidence that is ready for return to the agency. Due to limited storage, evidence submitters will be required to take evidence back upon delivering evidence. If an agency does not regularly visit the laboratory, periodic contact with the Evidence Control Department is requested to determine if any evidence is ready for return.

If biological evidence is submitted by mail, ensure that all evidence is securely packaged and that the submission information is complete. Submitting agencies will be notified of all evidence not received in the proper condition. Failure to submit evidence properly may result in delayed analysis.

The Preservation of Evidence Act is outlined in SC Code of Laws, Title 17, Chapter 28, Article 3. This act states that all physical evidence and biological material must be maintained if an individual is convicted or adjudicated of one or more of the offenses listed in the act. If your agency has evidence in which an individual was convicted or adjudicated in one or more of the offenses listed in the act, the Custodian of Evidence must register this evidence with the South Carolina Department of Corrections or the South Carolina Department of Juvenile Justice. The registration process for the South Carolina Department of Corrections can be completed at the following website: <https://sword.doc.state.sc.us/jail/>. If your agency needs to register evidence with the South Carolina Department of Juvenile Justice, contact the Office of the SC Inspector General at (803) 896-9595 for further details. Contact your local Solicitor's Office for information regarding the destruction of evidence or for a more detailed interpretation of this act.

#### **IV. REPORT INTERPRETATION**

The Evidence Control Department does not issue reports.

## FIREARMS & TOOL MARKS DEPARTMENT

---

### FIREARMS EVIDENCE EXAMINATION

#### I. CAPABILITIES AND SERVICES

The Firearms Department examines firearms to test their operability and also their compliance with various statutory regulations (ex. capability for full auto fire, barrel length, and/or overall length). The Department also examines and microscopically compares fired ammunition components (projectiles, cartridge cases, shotshells, etc.) recovered from a crime scene to test specimens fired from a firearm recovered from a suspect to determine if the firearm was used in the shooting. Similarly, fired ammunition components recovered from one crime scene can be microscopically compared with fired ammunition components from other crime scenes to determine if a single firearm was responsible for both shootings. The Department also performs serial number restoration and other discipline related examinations.

The Firearms (& Tool Marks) Department examines tools and microscopically compares tool marks from a crime scene to test specimens produced by a recovered tool to see if the tool was used in the crime. *The tool must be able to be linked to a suspect through possession, latent prints, or DNA. If the tool cannot be linked to a suspect through one of these methods, the evidence will not be accepted.*

The Firearms Department operates the Integrated Ballistics Identification System (IBIS) database. **NOTE:** All firearms and fired cartridge cases that are examined by the Firearms Department are automatically screened for IBIS entry. See the [IBIS](#) section for further information.

The Firearms Department is responsible for the destruction of firearms, knives, metal tools, etc. for various agencies in South Carolina.

#### II. EVIDENCE COLLECTION, PACKAGING, AND SUBMISSION PROCEDURES

The following information describes some suggested procedures for collection and packaging of typical firearms evidence and other related evidence. These procedures should not conflict with the methods used by crime scene personnel in collecting evidence for latent print or DNA processing. If they are in conflict with standard evidence collection methods, contact the Firearms Department to resolve the issue.

##### A. GENERAL INFORMATION

1. NO LIMITS ON QUANTITY OF EVIDENCE SUBMITTED – Submit ALL firearms related evidence at one time, if possible. Evidence recovered after initial submission

should be submitted *as soon as practical and before the Firearms report is published, if possible.*

2. Items requiring analysis by multiple disciplines (Latent Print/DNA/Trace Evidence):
  - If an item needs analysis by multiple departments, the requests should be made at the time of submission so the items can be routed to the other disciplines prior to the Firearms Department. The Firearms Department will normally decontaminate the item after which analysis by other disciplines will be significantly degraded.
3. Package evidence in such a way as to protect it from damage.
4. Fired ammunition components should be packaged individually and assigned individual item numbers.
5. Sharp items (i.e. fired bullets) should be packaged in small pasteboard boxes, metal tins, film canisters, or other similar containers.
6. Wet evidence, such as ammunition or ammunition components, should be allowed to air dry, when practical, or be placed in a box or paper bag that is porous and will allow the item to dry. Firearms in water are handled differently (see #6 below).
7. Heavy items should be placed in boxes.

## B. FIREARMS

1. **\*\*\*NO LOADED FIREARMS WILL BE ACCEPTED BY SLED EVIDENCE CONTROL\*\*\***  
If you transport a loaded firearm to SLED, leave it in your car. Contact the Firearms Department or Evidence Control prior to arrival for instructions and/or assistance. Once you arrive at SLED, Firearms personnel will come down and assist you with securing the loaded firearm (at your car) for submission. Safety should be your primary concern when handling firearms and ammunition!!! If for some reason you are not able to unload the firearm, if you are not familiar with how to unload a particular firearm, or if you are unsure about its loaded status, contact the Firearms Department for assistance.
2. Ammunition should *NOT* be packaged loose in the container with the firearm.
3. A tag bearing case information may be attached to the firearm for documentation purposes.
4. Zip ties should *NOT* be placed around the trigger guard as this can cause an unsafe condition.
5. **PACKAGING** – Firearms should be submitted to the Firearms Department in a sturdy box, if possible.
6. **FIREARMS IN WATER** – As a general rule, a firearm recovered under water should remain submerged in the same water in which it was recovered. If a firearm is recovered in salt water, it may be beneficial to rinse the firearm with fresh water and submerge it in fresh water for transportation to the laboratory. In some cases, the firearm may have to be protected with a rust preventative, especially if the firearm cannot be submitted to SLED quickly. If you have any questions regarding this information, contact the Firearms Department.

7. **Wet firearms** – Firearms that are wet (recovered in rain) should be packaged in a breathable container (cardboard box) and submitted as soon as possible. The firearm may have to be protected with a rust preventative, especially if the firearm cannot be submitted to SLED quickly. If you have any questions regarding this information, contact the Firearms Department.
8. **No visible serial number** – Firearms manufactured prior to 1968 may not have a serial number. Note that if a serial number is present, it is normally located on the frame or receiver.
9. **DO NOT** – There are several things that normally should not be done with a firearm prior to submission for firearms examination. Some examples follow:
  - a. Do NOT clean the bore, chamber or cylinder. In some cases, it may be necessary to remove debris to determine the firearms loaded status or to obtain data for documentation. This should be carefully done.
  - b. Do NOT cycle the action of a firearm any more than necessary.
  - c. Do NOT disassemble a firearm prior to submission.
  - d. Do NOT pick up a firearm by placing an object into the barrel.
  - e. Do NOT place cable ties, paper clips, or wads of paper, etc. in the barrel, ejection port, etc. in an attempt to make the firearm safe.

### C. AMMUNITION and AMMUNITION COMPONENTS

1. **EVIDENCE RECOVERY** – Removal of bullets, pellets, wads, and other projectiles from their resting place should be done without the use of metal forceps, metal tweezers, pliers, or other similar tools whenever possible. These instruments may cause further damage to evidence specimens, especially lead projectiles.
2. If a projectile is embedded in wood or some other hard material, it should be carefully removed. If you cannot easily remove the projectile from the material, carefully cut around the projectile including at least one inch of the surrounding material. Then package and submit the material and projectile for extraction and examination by firearms staff.
3. Projectiles removed from bodies at autopsy should be gently rinsed to remove excess blood and tissue. Wet projectiles should be allowed to dry before packaging.
4. **SAFETY** – Be aware that fired bullets and bullet fragments may have sharp edges that could injure the person collecting the evidence. Use the proper personal protective equipment.
5. **MARKING** – descriptive information should be placed on the proximal container. The projectile should not be marked directly.
6. **PACKAGING** – Each fired evidence specimen normally should be placed in a separate container, being careful to wrap or cushion the specimen with paper towels, paper tissue, etc. Small pasteboard boxes, metal tins, film canisters, or other similar containers will provide optimum protection to the specimen and allow room for descriptive information. Sturdy envelopes and plastic bags may also be used.

7. Shot pellets and/or bullet fragments recovered from a single impact site may be packaged together. Try to collect as many pellets or projectiles as practical from impact sites and along the projectiles' path. Don't forget that jacketed bullets may shed their jackets when traveling through a target.
8. Unfired ammunition recovered at the scene or in a suspect's possession that is the same type as used in the crime may have to be submitted for firearms examination or for test purposes. Quantities of unfired ammunition may remain in its original ammunition box (if applicable). Loose and/or large quantities of ammunition should be placed in a sturdy container.
9. Ammunition should *NOT* be packaged loose in the container with the firearm.

#### D. TOOLS and TOOL MARKS

1. **POTENTIAL TRACE EVIDENCE** – Tools and tool marked specimens should be examined for potential trace evidence, which may be easily lost. If prudent to do so, collect such trace evidence and package separately. Any analysis by the Trace Evidence Department must be performed prior to submission to the Firearms Department.
2. **PACKAGING** – Tools and specimens bearing tool marks should be wrapped separately so that one does not contact, contaminate, or otherwise damage the other in transit. The working area of the tool may also be further protected with a zip lock bag to prevent any loss of trace evidence. With large heavy tools, it is prudent to use a sturdy box for packaging along with cable ties to secure the tool in the box. If using plastic heat-sealable packaging material, additional protective material may need to be placed around the working parts of the tool to protect them. In addition, leave enough room at one end of the container so that the Firearms Examiner can open and reseal the container.
3. **CASTS** – If recovery and submission of the tool marked specimen is impractical, overall and close-up scale photographs of the specimen and tool marked areas should be taken. Then, multiple casts of each of the tool marked areas can be made with Mikrosil, Forensic Sil, or other similar products.
4. **MARKING** – Markings and descriptive information should be placed on proximal containers.
5. **PARTIAL ITEMS** – When submitting pieces of wire, cable, pipe, hose, etc., where officers must cut one end of a specimen to remove it from a larger "parent" item, wrap the "OFFICER CUT END" with tape and label it as such. The evidence or suspect "cut" end should be wrapped with tissue, paper towel, or similar material and secured so that the microscopic tool marks and any trace evidence will not be disturbed. Do NOT place tape on the suspected tool marked areas.
6. **RESTRICTIONS** – Do NOT submit recovered tools for comparison, unless these tools can be positively associated with a suspect through fingerprints, DNA, possession, etc. Do not submit suspect tool marks for examination unless a suspect tool is recovered that can be positively associated with a suspect.



## E. OBLITERATED SERIAL NUMBERS or DATA

Firearms with obliterated or partially obliterated serial numbers or data may be submitted for restoration purposes. Such firearms should be submitted and packaged in the normal manner.

## III. SPECIAL CONSIDERATIONS

Occasionally there is some confusion regarding the Integrated Ballistics Identification System (IBIS) and requests for IBIS entry. Note that all appropriate firearm test specimens and fired ammunition components analyzed by firearms examiners in regular casework will be routinely and automatically entered into the IBIS database, where applicable. See the IBIS section for further information.

If a situation is encountered that does not fit any of the scenarios described in this document, contact the Firearms Department at (803) 896-7399.

## IV. REPORT INTERPRETATION

When firearms evidence has been submitted and the examinations have been completed, the assigned Firearms Examiner will normally issue a formal report containing information regarding the results of the examinations and any related IBIS entry. Some of our typical results are as follows:

- A. Identification or positive – Example: “Item 1 was physically examined and microscopically compared with test cartridge cases fired by the Item 2 pistol. Matching individual identifying characteristics were found and it was concluded that Item 1 was fired by the Item 2 pistol.”
- B. Elimination or negative – Example: “Items 3 and 4 were physically examined and microscopically compared with each other and with test specimens fired by Item 5. Sufficient differences in class characteristics were found to conclude that Items 3 and 4 were not fired by the Item 5 pistol.”
- C. Inconclusive – Example: “Results of comparisons of Item 6 with test specimens fired by Item 7 were inconclusive.” This means the examiner could not positively conclude whether a specimen was or was not fired by a particular firearm. The submitted specimen (fired bullet or cartridge case) could have been fired by the submitted firearm or by another firearm with similar characteristics. This may be due to damage, a lack of sufficient markings, inconsistent test specimens, etc.
- D. Unsuitable for Identification – Example: “Microscopic examination revealed that the Item 8 fired bullet was unsuitable for identification.” This means the specimen displayed such limited markings that it could not be identified with a specific firearm or another like specimen. In some instances, there may be general class

characteristics visible that can be used to eliminate a firearm or another similar specimen.

In tool mark reports, similar conclusions are used; however, the wording of the conclusions will differ somewhat. The conclusions are similar and self-explanatory.

**GLOSSARY** - The following list of terms is provided to help clarify the language encountered in reports generated by the Firearms Department. In order to enhance the consistency of terminology, use these terms when describing evidence for submission.

- **Bullet** – A projectile or the part of a round of ammunition that travels down the barrel and towards the target.
- **Cartridge** – A complete round of unfired ammunition consisting of a bullet, cartridge case, gun powder and primer.
- **Cartridge Case** – The component of a round of ammunition that serves as the container for all the other components.
- **Fired** – This means that a bullet, cartridge case, etc. has been fired by a firearm.
- **Misfired** – This means that a cartridge or shotshell's primer was struck by a firing pin but failed to fire.
- **Muzzle** – The end of a firearm barrel from which the bullet or shot emerges.
- **Pellets** – Spherical projectiles commonly loaded into shotshells or shot cartridges.
- **Shotshell** – A complete round of ammunition designed to be fired in a shotgun and normally contains multiple projectiles. Shotshells are also called shotgun shells.
- **Unfired** – This means that the cartridge, shotshell, or ammunition component has not been fired by a firearm.
- **Wad** – An ammunition component(s) that is typically loaded in a shotshell between the gun powder and the projectile(s). Wads also are found in shot cartridges used in some handgun and rifle ammunition. Typically, wads are composed of paper, fiberboard, plastic, etc. A single shotshell may contain one wad or multiple wad components.

## V. CASE ACCEPTANCE GUIDELINES

Exceptions to these policies may be made on a case by case basis, at the discretion of the departmental supervisor and/or designee.

- A. **PRIORITY CASES** – Requests for “PRIORITY” examinations of evidence must have a demonstrable need, such as, needing results for warrants, making an imminent arrest, or similar circumstances.
- B. In cases where a “PRIORITY” request is made to examine evidence for imminent court proceedings, the Firearms Department requests to have fifteen (15) working days to complete such cases.
- C. **INTER-RELATED CASES** – All evidence examined by the Firearms Department is automatically screened and entered, when possible, into the IBIS database. Cases are automatically searched against each other using this technology. Therefore,

multiple case inter-comparisons by firearms examiners will not be conducted unless there is some demonstrable investigative link between the cases.

- D. CARTRIDGE CASES REMOVED FROM FIREARMS – Fired cartridge cases found in and/or removed from the cylinder of a revolver or from the chamber of other types of firearms will not be routinely examined or compared microscopically.
- E. PROPERTY CRIME cases involving tool mark requests will not be routinely accepted. Such cases with associated personal injury usually will be accepted. (See F below)
- F. TOOL MARKS – Before any case involving a tool mark request is accepted, there must be a suspect tool available that can be linked to a suspect via possession, latent prints, DNA, and/or demonstrable investigative information. If no such tool or link is available, the case will not be accepted.
- G. HUNTING/WILDLIFE related firearm cases will not be routinely accepted unless personal injury is involved.
- H. ANIMALS – Firearm cases involving crimes against animals will not be routinely accepted.
- I. SUICIDES – Firearm cases involving suicides, attempted suicides, or murder-suicides will not be routinely accepted.
- J. IBIS
  - 1. Firearms submitted for IBIS entry only, which do not meet the guidelines for IBIS entry, normally will be returned without examination.
  - 2. Firearms and/or fired specimens submitted for IBIS entry must have been seized or collected in reference to a criminal act.
  - 3. Badly rusted, corroded, or non-functional firearms submitted for IBIS entry only, will not be restored to a functional condition for test firing unless this can be easily accomplished.
  - 4. Agencies having access to the Charleston County Sheriff's Office IBIS are encouraged to submit firearms and evidence for IBIS entry to that agency. SLED will continue to verify potential "hits" from their IBIS correlations.
- K. BB GUNS – Pellet guns, BB guns, and/or non-firearm replicas of firearms will not be routinely examined.
- L. EVIDENCE NOT REQUIRING EXAMINATION – Contributors should only submit evidence that requires examination. Extraneous items that do not require examination but are being submitted merely for the purpose of simplifying the chain of custody should NOT be submitted.
- M. RETURN OF EVIDENCE WITHOUT EXAM – Unexamined or partially examined firearm and/or tool mark evidence that is present in the Forensic Services Laboratory may be returned to the submitter if authorized by the Department Supervisor, unless the contributor has made contact with a forensic scientist and conveyed a vital need for examination.
- N. NON-STANDARD EXAMINATIONS – Cases with requests for any unusual or non-standard examinations such as ejection pattern testing or routine firearm function testing will not be routinely accepted.
- O. FIREARM TRACE/REGISTRATION CHECK – the Firearms Department does not conduct firearm traces and/or registration checks.
- P. DESTRUCTION CASES – Contributors submitting firearms, and/or related items for

destruction must contact a member of the Firearms Department to schedule a convenient time for submission of such items. The contributor also must follow the Firearms Department guidelines for submission of such items. These guidelines include, but are not limited to, the following;

1. Normally, no more than twenty-five (25) firearms can be submitted at one time.
  2. The firearms must be unloaded prior to submission to SLED. If a firearm is loaded or suspected to be loaded, the contributor must notify the Firearms Department **prior** to bringing the firearm into the Forensic Services Laboratory.
  3. THE PRESERVATION OF EVIDENCE ACT 2008 - All of the firearms submitted should have “cleared” any legal proceedings, firearms traces, NCIC checks, etc. and are able to be destroyed. If firearms are submitted to SLED for destruction, you are assuring us that they are not subject to the Evidence Preservation Act of 2008 and your agency is willing to assume sole liability and responsibility for their destruction.
  4. The contributor must provide an accurate inventory of the firearms and items submitted, including the make, model, serial number, caliber, or a description of the item. There also must be a rapid way to link the items listed on the inventory list to the item itself. This can be done with alpha or numeric characters and labels or some other similar means placed on each item.
  5. The contributor must be able to accompany the items for destruction to the Firearms Department during the evidence submission procedure so that Firearms personnel can conduct an accurate inventory of the items before the contributor leaves. This applies mainly to large numbers of items that are not in sealed containers.
  6. No ammunition, explosive devices, chemical sprays, tear gas, or related items will be accepted.
- Q. OC SPRAY, TASERS, ETC. – The Firearms Department does not perform examinations on chemical spray containers, Tasers, and similar devices.

## INTEGRATED BALLISTICS IDENTIFICATION SYSTEM (IBIS)

### IBIS OVERVIEW AND TRADITIONAL EVIDENCE SUBMISSION

#### I. CAPABILITIES AND SERVICES

The Integrated Ballistics Identification System (IBIS) which operates on the National Integrated Ballistic Identification Network (NIBIN) is owned and provided to various state and local agencies by the Bureau of Alcohol, Tobacco, and Firearms (BATF). The IBIS system is located in the South Carolina Law Enforcement Division's (SLED) Forensic Services Building. It is operated by Firearms Department personnel in accordance with BATF protocols.

The IBIS enables an operator to acquire digital images of individually marked areas on fired cartridge cases. These images are converted into digital "signatures" and are compared, through an automated process, with other stored images to determine if **possible** links exist between cases or incidents that may not have been previously linked through traditional investigative means. For every specimen entered, a list will be prepared by the computer for the operator to review. It is then up to IBIS personnel to review the images and determine if there are any "High Confidence Correlations". (A High Confidence Correlation occurs when we find a **potential** match on the IBIS). We will notify your Agency of the **potential** lead for **INVESTIGATIVE PURPOSES ONLY**. **IBIS Leads cannot be utilized for the establishment of probable cause for warrants or for any court related purposes UNTIL the lead has been confirmed through microscopic comparison of the evidence by a firearms examiner.** You can request that the High Confidence Correlation be confirmed by submitting your evidence for a FULL FIREARM EXAM. If the High Confidence Correlation is confirmed, it is then considered a verified "HIT".

#### II. EVIDENCE COLLECTION, PACKAGING AND SUBMISSION PROCEDURES

**Traditional Evidence Submission for IBIS database entry** – See the Firearms Department section on Evidence Collection, Packaging, and Submission Procedures.

- **IBIS Only submissions** – Evidence which does NOT require a full firearms exam and only needs database entry can be submitted directly to IBIS. Examples of types of evidence accepted through this method:
  - **Firearms**
  - **Test specimens from firearms** – firearms test fired by your agency
  - **Cartridge cases recovered from crime scenes** – If your agency does not need a full firearms exam at this time, but only wants to potentially link your crime scene to any other crime scenes, your evidence can be submitted directly to IBIS. **NOTE:** Evidence submitted through this method can ALWAYS be resubmitted at a later date for the full firearms examination. This method simply allows for quicker database entry in an attempt to link cases while leads may still be active.

- **IBIS by Appointment submissions** – See the [IBIS Entry by Appointment](#) section. Examples of types of evidence accepted through this method:
  - **Firearms**
  - **Test specimens from firearms** – firearms test fired by your agency
  - **Cartridge cases recovered from crime scenes** – if your agency does not need a full firearms exam at this time, but only wants to potentially link your crime scene to any other crime scenes, your evidence can be submitted directly to IBIS. Note: Evidence submitted through this method can ALWAYS be resubmitted at a later date for the full firearms examination. This method simply allows for quicker database entry in an attempt to link cases while leads are still hot.

### III. SPECIAL CONSIDERATIONS

Occasionally there is some confusion regarding the Integrated Ballistics Identification System (IBIS) and requests for IBIS entry. All appropriate firearm test specimens and fired ammunition components analyzed by firearms examiners in regular casework are routinely and automatically entered into the IBIS database, where applicable (see restrictions listed below). The computerized system continually compares and screens the new entries in our regional database (South Carolina, Georgia, North Carolina and Virginia). SLED also has the capability to manually search any other IBIS region anywhere in the United States; however, you will need to provide a demonstrable investigative lead to justify the request.

Not all firearms related evidence is entered into the SLED IBIS database. Limitations are based on BATF protocols and the calibers commonly used in our region. Below are examples of the guidelines that we follow when evaluating the suitability of a specimen for IBIS entry.

#### **CALIBERS ENTERED INTO THE IBIS (Cartridge cases and test fired cartridge cases):**

- 25 Auto / 6.35mm Auto / 25 ACP
- 32 Auto / 7.65 x 17mm / 32 ACP
- 357 Sig
- 380 Auto / 9 x 17mm / 9mm Kurtz / 9mm Browning Court / 380 ACP
- 9mm Makarov / 9mm Mak / 9 x 18mm
- 9mm Luger / 9 x 19mm / 9mm Parabellum / 9mm NATO
- 40 S&W / 40 Auto
- 10mm Auto
- 45 Auto / 45 ACP
- 45 GAP
- 223 Remington / 5.56 NATO / 5.56 x 45mm
- 7.62 x 39mm Russian

#### **SPECIMENS NOT ENTERED INTO THE IBIS:**

- Bullets
- Revolver cartridge cases
- Rimfire cartridge cases
- Badly damaged, poorly marked, unsuitable cartridge cases
- Shotgun shells (shotshells)
- Police firearms (unless they have been used in a crime)

*If you have further questions about the SLED IBIS, contact the Firearms Department at (803) 896-7399 or email [IBIS@sled.sc.gov](mailto:IBIS@sled.sc.gov).*

#### **TWO YEAR RULE**

Evidence that has been entered into the IBIS database should be retained by the submitting agency for a period of not less than two years from the date indicated on the IBIS label or from the date the evidence was returned to your agency.

#### **WHY?**

Two (2) years allows time for other agencies to submit their evidence and also for backlogged cases to be worked and entered into the IBIS database. If, at a later time, a High Confidence Correlation is found and evidence has been disposed of or destroyed, there may not be a way to confirm the link between the cases. Therefore, it is crucial to retain the evidence for at least two years from the date indicated on the IBIS label or from the date the evidence was returned to your agency.

#### **RELEASE OF ITEMS ENTERED IN IBIS:**

If you decide to release a firearm (return to owner, sell, trade for police equipment, etc.) that has been entered into the IBIS database, it is imperative that you contact the Firearms Department with this information. The database needs to be updated to show that the firearm has been released from police custody and is back in circulation (potentially used in new crimes). By changing the status of the firearm from “in police custody” to “back on the street” IBIS will reinstate screening the firearm with crimes committed in the future.

## **IV. REPORT INTERPRETATION**

### ***A. EVIDENCE SUITABLE FOR IBIS ENTRY***

When firearms evidence is submitted and the examinations have been completed, the assigned examiner/forensic scientist/forensic technician will normally issue a formal report/letter containing information regarding the results of the firearms examinations

and any related IBIS entry. The following are examples of IBIS statements found in formal reports/letters:

*"Item 4 was entered into the Integrated Ballistics Identification System (IBIS). These exhibit(s) will automatically be correlated with exhibits from SC, GA, NC and VA. Should any investigative leads be developed, your Agency will be notified. Please retain the evidence for a minimum of two years in order to maintain its availability for future comparison related to IBIS activity."*

Generally, this paragraph means that the evidence item(s) met the basic criteria for IBIS entry and it was entered into the IBIS database.

#### *B. EVIDENCE NOT SUITABLE FOR IBIS ENTRY*

If the evidence specimen (cartridge case and/or firearm) is the wrong caliber or if it is poorly marked, unsuitable for identification purposes, or if the firearm marks test specimens poorly, IBIS entry will not be performed. The following is an example of an IBIS statement that would be found in the formal report/letter:

*"Item 4 was not entered into the Integrated Ballistics Identification System (IBIS) as it did not meet the current SLED criteria for entry."*

#### *C. LETTERS, REPORTS, AND COMMUNICATION*

1. Normally, a formal report or letter will be issued and posted on iLAB when the initial examinations and/or database entry has been completed. The IBIS continually and automatically searches against all new entries on a daily basis. Your Agency will *NOT* normally be contacted (other than the original formal report/letter) unless a High Confidence Correlation is found.
2. **Investigative leads** - If a **High Confidence Correlation** is found, your Agency will be notified of the potential investigative lead. Your Agency will be provided basic contact and case information for both/all cases so that you can reach out to other agencies/investigators. Case information can be exchanged and the value of the potential link can be evaluated.
3. **Hit Confirmation** - **If your Agency decides that a formal report confirming the High Confidence Correlation is needed to establish probable cause for warrants or for any other court related purposes, the evidence from both/all cases must be resubmitted with a Firearms request for confirmation.**



## INTEGRATED BALLISTICS IDENTIFICATION SYSTEM (IBIS)

### IBIS ENTRY BY APPOINTMENT

#### I. CAPABILITIES AND SERVICES

The IBIS Entry by Appointment Program is a highly efficient, streamlined, and simplified version of the traditional IBIS program. This program was designed as a way to increase the efficiency and throughput of the IBIS and allow for our customers to have test fires from seized firearms and/or evidence cartridge cases from crime scenes entered into IBIS *faster* than going through the normal evidence submission process. It has been shown that the greater the time between the date of the crime and the date an investigating officer is provided a new lead, the less useful the lead becomes. This is one of the motivating factors in developing the “IBIS Entry by Appointment” program. IBIS entry will be performed the same day it is brought to SLED with correlations typically reviewed the next business day. If a potential match is found, your Agency will be notified immediately of the potential link to another case dramatically reducing the time between the crime and when the investigator receives a new lead.

For an overview of the IBIS program as a whole, see the [IBIS Overview and Traditional Evidence Submission](#) section.

#### II. EVIDENCE COLLECTION, PACKAGING AND SUBMISSION PROCEDURES

**Evidence collection** and **packaging** should follow the same general guidelines outlined in the [Firearms](#) section.

**Submission** – Items entered into the IBIS database through the IBIS Entry by Appointment program are *NOT* submitted to SLED through the “traditional process.”

Your Agency will call and make an appointment for IBIS entry, fill out a short form providing limited case information and a few details describing the evidence, and then bring your evidence to the SLED Forensics Laboratory. Your staff will be met in the lobby and escorted to the IBIS room where they will open the evidence and provide it to the IBIS staff. The evidence will be entered into the database while your staff waits and watches. Upon completion of database entry, IBIS staff will complete the form you provided indicating which items were or were not entered into the database. Your staff will repackage the evidence and reseal the containers. *The evidence never leaves your Agency’s custody.* Your staff will then be escorted back to the lobby with evidence in hand.

### III. SPECIAL CONSIDERATIONS

Seized firearms will need to be test fired to produce test cartridge cases for database entry. There are two basic options here:

**Test fire yourself** – The most efficient use of the program comes if your staff test fires the firearms yourselves and only bring the test fired cartridge cases for database entry. This method provides the quickest time in and out of the Laboratory. For guidelines to assist with this process contact the SLED Firearms Department.

**SLED personnel test fire in your presence** – As an alternative, you can bring the firearms as part of the IBIS Entry by Appointment program and SLED staff will test fire the firearms for your Agency. Your personnel will be able to witness this process also. Once test firing is complete, the rest of the appointment will continue as described above. The test specimens will be provided to your Agency after they are entered into the IBIS.

All evidence (firearms or fired cartridge cases) that needs to be processed for Touch DNA or Latent Prints must have these examinations performed **prior** to being triaged through the IBIS Entry by Appointment (EBA) program. Once evidence has been triaged through the IBIS Entry by Appointment program, it will no longer be eligible for Touch DNA or Latent Print examination.

### IV. REPORT INTERPRETATION

When IBIS entry is complete, both the submitting officer and the IBIS Technician will sign the completed SLED IBIS Entry by Appointment Information Form. Your Agency's representative will be given a copy of this form once entry has been completed. This form will be your Agency's notification of entry. Your Agency will not receive an additional IBIS letter stating entry has been performed.

## LATENT PRINT DEPARTMENT

---

### *EVIDENCE PROCESSING FOR LATENT PRINTS & LATENT PRINT EXAMINATION*

#### **I. CAPABILITIES AND SERVICES**

The Latent Print Department utilizes various techniques for the development and enhancement of latent fingerprints on submitted evidence, conducts examinations of developed and/or submitted latent prints to known standards, conducts AFIS searches, and utilizes various techniques to attempt to recover fingerprint standards from the human skin of unknown persons for identification.

#### **II. EVIDENCE COLLECTION, PACKAGING, AND SUBMISSION PROCEDURES**

Latent impressions and known standards submitted as digital images must include a scale and must be submitted as a .tif file with a minimum scan resolution of 800dpi. Submitters are highly encouraged to include the local agency case number in the file name of each image.

Porous items (i.e., wood, paper, cardboard, etc.) should be placed in a bag or envelope and sealed.

Non-porous items (i.e. guns, knives, glassware, cans, etc.) should be packaged in a manner that prevents or limits the evidence from contacting other surfaces. Evidence contact with packaging can obliterate latent evidence that may be present. Submitters are encouraged to contact the Latent Print Department when unsure about the packaging of evidence.

Evidence being submitted for latent print processing that contains a suspected controlled substance should have the controlled substance removed prior to submission to the Latent Print Department for analysis. Evidence Control must be notified upon submission if this cannot be accomplished.

It is recommended that prior processing of evidence to be submitted to the department not be conducted. If prior processing is conducted, the submitter should include the processing information with the submission documentation.

If visible prints are present in blood, grease, etc., the Latent Print Department should be consulted prior to submitting to the laboratory. Photographing these visible prints prior to packaging or transport is recommended.

The local agency shall be notified by report if palm print standards are needed. Finger and palm prints (major case prints) of all persons of interest for comparison should be submitted. Palm print standards should include the lower finger joints and entire palm to the wrist. The local agency is encouraged to contact the reporting examiner for any questions related to obtaining major case prints.

In order to identify a deceased person, inked standards must be submitted for comparison. It is recommended that finger and palm standards are recorded and submitted. If applicable, barefoot impressions may also be necessary. If legible prints cannot be obtained, the hands, fingers or available skin from the fingers/hands of a decedent may be submitted, upon permission of the coroner of jurisdiction. Human remains will be returned to the submitting agency or destroyed upon authorization by the coroner of jurisdiction.

Each detached finger or hand should be packaged in a separate, unbreakable, watertight, and airtight container. These containers must be appropriately labeled (i.e., Right Hand, Left index). Transport evidence to the laboratory as quickly as possible in the condition in which it was found (i.e., in water, frozen, dry). Evidence containers should be placed in coolers packed with ice packs or dry ice. The addition of any chemical, such as formaldehyde, is not recommended as it may accelerate the decomposition of the skin. The Latent Print Department may be contacted for additional guidance if necessary.

Latent print examinations will be conducted with known standards available to the examiner. Suspect and elimination standards should be submitted when available. Photocopies and facsimile copies of known standards should not be submitted. The Latent Print Department can access known standards on file with SLED CJIS and the FBI if the required personal information (DOB, SSN, SID#, and/or FBI#) is provided. The submitting agency will be notified by report if known subject standards were not available.

For cases with a known or developed subject in which a large volume of latent prints exist, the examiner may cease examination of the latent prints once the subject is identified. In such cases, the laboratory report will indicate that latent print evidence in the case was not analyzed. The submitting agency shall be consulted prior to the issuance of the report. For such cases, the unexamined latent print evidence may be resubmitted at a later date if additional examination is necessary.

### **III. SPECIAL CONSIDERATIONS**

- Evidence requiring latent print examination should be handled as little as possible.
- Gloves should be worn when handling items requiring latent print examination.

- Secure large items bearing latent prints to a rigid surface to prevent shifting and contact with other items.
- Latent lifts should be submitted in a sealed envelope.
- Known fingerprint standards should be treated as evidence when submitted to the laboratory.
- Do not wrap non-porous items in paper, cloth, or plastic wrap.
- Do not cover items to be examined for latent prints with evidence tape.
- Do not cover any developed latent prints with lifting tape or other clear tape.

## **IV. REPORT INTERPRETATION**

### *LATENT PRINT EXAMINATION RESULTS*

**1. Identified with Item \_\_\_\_/ (subject name).**

To be used when the latent print and known print originated from the same source. The latent print and known print have sufficient corresponding minutiae and there are no unexplainable differences.

**2. Not identified with Item \_\_\_\_/ (subject name).**

To be used when the latent print and known print originated from two different sources.

**3. Inconclusive based on the quality of Item \_\_\_\_/ (subject name).**

To be used when the corresponding areas of friction ridge detail in the known standards are absent or unreliable.

**4. Inconclusive due to a lack of comparable individual characteristics with Item \_\_\_\_/ (subject name).**

To be used when all features present in the latent print correspond with the known standard, but are not sufficient enough to allow the examiner to identify or eliminate the known standard as being the source of the latent print.

**5. No value for comparison.**

To be used when the features present in the unknown print are not sufficient enough to allow for a comparison.

**6. No fingerprint evidence was observed.**

This result shall only be used to describe evidence in which no fingerprint evidence was observed.

**7. Partial palm print.**

To be used when the area of ridge characteristics being examined is clearly determined to be palmar in nature.

**8. No known standards were available for comparison.**

To be used when no known standards were submitted by the contributing agency and the examiner was unable to locate known standards upon the completion of a records check.

**9. No Examination Conducted.**

This result shall be used to report latent impressions that are not examined by a latent print examiner.

**10. The item was chemically processed.**

This wording shall be included in the result for items that are processed for latent prints.

**11. Impression evidence in this case was examined utilizing the ACE-V methodology.**

ACE-V stands for Analysis, Comparison, Evaluation, and Verification and is the methodology used by the Latent Print Department when conducting fingerprint examinations.

## **AUTOMATED FINGERPRINT IDENTIFICATION SYSTEM (AFIS)**

### **I. CAPABILITIES AND SERVICES**

The Latent Print Department utilizes AFIS technology.

### **II. EVIDENCE COLLECTION, PACKAGING, AND SUBMISSION PROCEDURES**

Latent fingerprints and palm prints in the form of latent lifts and/or digital images may be submitted to the Latent Print Department for AFIS search. Latent lifts should be properly labeled to include the location lifted, date lifted, and the person who collected the evidence. Digital images must include a scale in the image. Submitted latents will be evaluated to determine the suitability for AFIS entry.

### **III. SPECIAL CONSIDERATIONS**

For AFIS requests where victim and/or witness information is provided, they will not be eliminated prior to the AFIS search. Such cases should be submitted with a latent print request if elimination is preferred.

AFIS results do not reflect the latent print's value for examination to a known standard. AFIS cases may be re-submitted for latent examination when suspect information becomes available.

Requests to confirm the identity of known, living subjects (i.e. uncooperative persons, persons providing aliases, etc.) must be directed to the SLED Crime Information Center for a ten-print search. The SLED Crime Information Center can be reached at 803-896-7005 or 803-896-7165.

### **IV. REPORT INTERPRETATION**

Results from an AFIS request will be reported in one of the following formats:

#### ***A. AFIS SEARCHED***

**No identifications were effected after the above items designated as AFIS Searched were searched on the South Carolina Automated Fingerprint Identification System (SCAFIS) and/or the Next Generation Identification (NGI) System. The items were not stored in the unsolved database for continuous search. You may request that the latents be re-searched at any time.**

Using the AFIS searched result indicates all suitable latents in a particular case were entered into the system and searched against the database without a person being identified. The contributor is encouraged to submit known fingerprints if suspects are developed during the course of the investigation.

*B. AFIS SEARCHED/STORAGE*

**No identifications were effected after the above items designated as AFIS Searched/Storage were searched on the South Carolina Automated Fingerprint Identification System (SCAFIS) and/or the Next Generation Identification (NGI) System. The items were stored in the unsolved database for continuous search. Your agency shall be notified of any identification that results from the continuous search.**

Unidentified latents can be stored in the unsolved latent file for continuous search against new fingerprint records entering the database. If a potential hit occurs from an unsolved latent file search, an examination can be conducted by a forensic scientist if the latent evidence is available.

Submitting agencies are encouraged to maintain latent evidence received from the laboratory when an AFIS Searched/Storage result is indicated. Latents stored in the AFIS are not images that can be used by the latent examiner to conduct examinations with known standards in the event of a reverse search hit. The Latent Print Department shall notify the agency if evidence needs to be re-submitted for examination. If the latent evidence is no longer available, no further examinations shall be conducted.

For cases that no longer require latents to be stored for continuous search, it is requested that the agency notify the Latent Print Department so the latent entry can be purged from AFIS.

*C. AFIS NOT SEARCHED*

**The above items designated as AFIS Not Searched were not searched on the South Carolina Automated Fingerprint Identification System (SCAFIS) and/or the Next Generation Identification (NGI) System.**

The most common reason for an AFIS Not Searched result is latent quality.



## PHOTOGRAPHY STUDIO

### I. CAPABILITIES AND SERVICES

The Photography Studio provides specialized photography services in support of the SLED Forensic Services Laboratory. The studio can also provide assistance to federal, state, and local law enforcement agencies upon request.

The Photography Studio provides technical expertise in the following categories:

- General evidence photography
- Impression evidence photography for examination
- Alternate light source photography
- Infrared photography
- Digital image enhancement
- Film scanning
- Aerial photography

### II. EVIDENCE COLLECTION, PACKAGING, AND SUBMISSION PROCEDURES

Requesting agencies are encouraged to contact the Photography Studio prior to submitting evidence to the Forensic Services Laboratory.

## QUESTIONED DOCUMENT DEPARTMENT

---

A document is defined as anything upon which a mark is made for the purpose of conveying a message. The examination of questioned documents consists of the analysis and comparison of documentary evidence such as handwriting with known material in order to establish the authenticity of the contested material as well as the detection of alterations.

The Questioned Document Department has a wide array of equipment including cameras, microscopes, a Video Spectral Comparator (VSC-ink differentiation), and an Electrostatic Detection Apparatus (ESDA- indented writing detection). This department's examinations are multifaceted; incorporating microscopic examinations with instrumental analyses designed specifically for forensic document problems. Many types of examinations are necessary in order to resolve cases involving forgeries, election fraud, bank robbery notes, suicides, and threats to public officials.

### **I. CAPABILITIES AND SERVICES**

The Questioned Document Department conducts scientific examinations on evidence requiring a determination of authorship and authenticity. The following are examinations provided by the Questioned Document Department:

- Identification and comparison of handwriting, hand printing, typewriting, check writers, rubber stamps, and various printing and duplicating processes
- Identification and comparison of inks and paper
- Detection of alterations and obliterations
- Restoration of charred, water soaked, and shredded documents
- Decipherment of indented writing on documents
- Detection of obliterations or forgery of lottery tickets
- Detection of counterfeit currency, driver's licenses, event tickets, etc.

### **II. EVIDENCE COLLECTION, PACKAGING, AND SUBMISSION PROCEDURES**

#### **A. COLLECTION AND PRESERVATION OF EVIDENCE**

1. All documents should be handled so that their condition, when acquired by the investigator, will be preserved. Documents should be placed in protective transparent folders. They should not be taped, folded, stapled, or creased, and should be handled as little as possible. If torn or mutilated, documents should be submitted in that condition with proper precautions to prevent further damage.

- Charred paper should be carefully packed in cotton or similar material and transported personally to the laboratory.
2. Special care must be taken with potential indented writing cases. Do not write on any packaging as it will transfer onto the questioned document.
  3. It is imperative that original documents be submitted for examination, if they are still in existence. Questioned and known samples should be designated as such. It is imperative for the examiner to know which samples are standards and which are unknowns.
  4. If a latent fingerprint or DNA examination is also needed, this request should be made during pre-log. It is recommended that this additional request also be indicated on the evidence packaging.
  5. Conclusions reached by the examiner are based solely upon examination of the documents involved; however, any information which may be of assistance in conducting the examination should be provided. Some examples might be the abnormal physical or mental condition of the person who executed the writing, any unusual conditions, under which the document was allegedly produced, or the fact that a typewriter was recently repaired.

**B. OBTAINING COLLECTED AND REQUESTED STANDARDS**

1. The writing of every person will contain a certain range of variation, with some people having little variation and others a considerable range. Many factors cause individuals to vary their handwriting, but one of the most common causes of variation is intentional disguise. It is advisable to obtain normal course of business writing of the suspect. Forms are available from the Questioned Document Department to facilitate collection of standards.

“COLLECTED” writings are those executed during the normal course of business or social activities when the writer has no knowledge they are providing standards. Obtain collected writing in addition to requested standards. Possible sources of “collected” handwriting may be:

- Affidavits
- Banking related documents including checks, signature cards and deposit slips
- Business license applications
- Credit Cards
- DMV records
- Letters, notebooks, and diaries
- Inmate, court and police paperwork
- Utility company applications
- Employment related documents including job applications, W4 forms and receipts
- Passports

- Mail return receipts
- Rental or equipment contracts
- School and college notes, tests and papers
- Social security cards/papers
- Traffic tickets
- Voter registration cards

It is the responsibility of the submitting officer to authenticate suspects' collected standards received from a business, school or social environment. Collected standards are accepted by the examiner as known writing of a particular writer. If at any point, it is revealed that one or more standards cannot be authenticated, the conclusion based on those standards becomes null and an examination must be conducted on the remaining evidence.

2. "REQUESTED" writings are those executed at the request of the investigator. It is desirable to obtain these standards produced by both the right and left hands of the subject. In all cases, indicate whether the subject normally writes with the right hand or the left hand.
3. It is imperative that a number of standards be submitted to determine the writing habits of the individual. These basic rules need to be followed when obtaining handwriting standards:
  - Dictate all material. Do not let the subject see or copy the questioned writing.
  - Duplicate the writing conditions as closely as possible.
  - Duplicate the writing instrument and the space available for writing.
  - If questioned writing is hand printed, request hand printing. If questioned writing is cursive, request cursive writing.
  - Dictate the entire text of the questioned material verbatim.
  - Do not offer help in spelling.
  - Obtain an adequate quantity of standards (approximately 25). Each writing standard should be performed on a separate index card or piece of paper.
  - Forgery cases should include normal course of business writing from the victim.
  - The writer and investigator should initial and date each requested standard.
4. Obtaining "requested standards" of handwriting:
  - **QUESTIONED** - handwriting on face of check
  - **STANDARDS** - 25 blank checks of same size completed by suspect, using same text.
  - **QUESTIONED** - endorsement on check
  - **STANDARDS** - same signature (and address) written on back of 25 blank checks or separate slips of paper comparable in width.
  - **QUESTIONED** - extended writing i.e., obscene letter, holdup notes, etc.

- **STANDARDS** - same signature or notation written 25 times on separate slips of paper (lined or unlined as the case may be). Writing should be confined in approximately the same area.
5. Failure to obtain proper and adequate known standards for comparison with the questioned writing often results in inconclusive results.
  6. The Questioned Document Department is available to assist in taking standards on a case by case basis. Please contact the department to make arrangements.
  7. If a subject is uncooperative they can be legally compelled to provide standards. Please contact your Solicitor for further guidance.

C. OBTAINING COMPARISON STANDARDS FOR PHOTOCOPIERS, PRINTERS, RUBBER STAMPS AND TYPEWRITERS

In cases involving photocopiers, printers, rubber stamps, or typewriters, please contact the Questioned Document to discuss the appropriate course of action for evidence collection and submission.

### III. SPECIAL CONSIDERATIONS

The results of examinations are dependent upon the quality of writing standards submitted for comparison and the discernment of the questioned writing(s).

### IV. REPORT INTERPRETATION

Due to the variety of possible results, if you have a case specific question, contact the Questioned Document Department.

---

## TOXICOLOGY DEPARTMENT

---

### I. CAPABILITIES AND SERVICES

The Toxicology Department is responsible for the analysis of biological fluids and tissues for the presence or absence of alcohol, drugs, and poisons. The department has a wide array of instrumentation including: Gas Chromatography/Mass Spectrometry (GC/MS), Liquid Chromatography/Tandem Mass Spectrometry (LC-MS/MS), Headspace Gas Chromatography, Headspace Gas Chromatography/Mass Spectrometry, and Enzyme Linked Immunosorbent Assay (ELISA). Additionally, the toxicologists interpret their findings in respect to impairment or toxicity of the compounds detected.

The department primarily handles postmortem and driving under the influence (DUI) investigations. In addition, the department also handles criminal sexual conduct cases, moonshine cases, investigations into potential poisonings and provides emergency analytical services in life or death situations. Rapid preliminary analysis is provided in cases involving child fatalities or officer involved shootings.

A. Typical toxicological analysis is based on case type and may include:

1. Analysis for volatiles (i.e. ethanol, methanol, acetone, isopropanol, difluoroethane, tetrafluoroethane, isoflurane and toluene)
2. Preliminary drug screen
  - a. Amphetamine
  - b. Methamphetamine
  - c. Benzodiazepines
  - d. Cocaine metabolite
  - e. Methadone
  - f. Tramadol
  - g. Zolpidem
  - h. Opiates
  - i. Oxycodone
  - j. Carisoprodol
  - k. Marijuana metabolite
  - l. Buprenorphine
  - m. Dextromethorphan
  - n. Barbiturates
  - o. Phencyclidine (PCP)
  - p. Tricyclic Antidepressants
  - q. Fentanyl
3. General drug screen by GC/MS
4. General drug screen by LC-MS/MS
5. Confirmations and quantitations of present compounds where appropriate

B. Toxicology Department Summary – Capabilities and Services

1. Analysis of blood, urine, other biological fluids and tissues for:
  - Ethanol and other volatiles
  - Drugs – drugs of abuse and other clinically significant drugs
  - Poisons (i.e. carbon monoxide, arsenic, strychnine, cyanide, pesticides and herbicides)
2. Analysis of liquids (i.e. moonshine) for ethanol and other volatiles
3. Consultation and technical assistance in suspected or known poisoning cases.
4. Consultation with coroners, pathologists, investigators or attorneys concerning the results of analyses and interpretation of the toxicological significance of those findings.
5. Expert courtroom testimony in cases providing results of analysis and interpretation of the toxicological significance of those findings.

## **II. EVIDENCE COLLECTION, PACKAGING, AND SUBMISSION PROCEDURES**

### **A. Suggested Collection and Submission of Samples for Death Investigation:**

1. Choice of Containers
  - a) It is recommended that specimens be placed in containers which most closely fit the mass/volume of the specimen. For example, the small volumes of vitreous humor should be placed in pediatric vacutainers.
  - b) Physiological fluids should be submitted in standard, non-expired vacutainers. Solid tissues should be placed in separate polypropylene type containers. The polypropylene type containers should be designed for biological sample storage and be leak proof in design. Consult the SLED Toxicology personnel should there be any questions regarding specimen submission.
2. Choice of Specimen
  - a) Blood:
    - Whole blood – at least 7 mL in a gray top vacutainer. Whole blood is preferred over plasma or serum for certain tests. It is requested in death investigation cases that multiple tubes be submitted to ensure sufficient sample with the preferred blood source being peripheral blood. A red or lavender top tube of blood should be submitted in all cases where Carboxyhemoglobin may be present (ie. Fire death, vehicle exhaust) due to an interference caused by the preservative in gray top tubes with the Carboxyhemoglobin analysis.
    - Serum – if possible, 7 mL in a gray top vacutainer. Serum tubes that are submitted wrapped in parafilm often leak. It is requested that if the

container is not leak proof, that the liquid sample be transferred to a suitable sealed vacutainer.

- Plasma – 7 mL in a gray top vacutainer.

**NOTE:** Other types of vacutainers are accepted but the anti-coagulant and preservative in the gray top vacutainer make it the container of choice.

- b) Urine: The entire volume of urine present should be submitted in a leak resistant polyethylene type bottle and closed with a screw cap. Desired minimum sample volume is 20 mL.
- c) Ocular Fluid: Vitreous humor should be submitted in a leak proof tube. Pediatric sized tubes are recommended with a minimum sample volume of 2 mL.
- d) Bile: Bile may also be submitted in a leak proof tube.
- e) Gastric or Duodenal Lavage – Fluid Contents: Mix fluids well; transfer approximately 30 mL into a leak resistant polyethylene type bottle with a screw cap.
- f) Surgical/Post Mortem Specimens of Organ Tissues: Place each specimen type into a separate polypropylene type bottle. Optimal amounts are approximately 30 g of specimen. Transport specimens frozen if possible.
- g) Fixed or embalmed specimens: Place each specimen (no more than 30 g) into separate polypropylene containers. Place approximately 5 mL of fixative or embalming fluid into a separate polypropylene container.
- h) Decomposed Specimens: When possible, ship specimens frozen in polyethylene type containers. Maggots and insect casings may also be submitted for qualitative analysis.

**NOTE:** Urine blood collection kits are available through the SLED Evidence Control Department. These kits include two gray top vacutainers for blood submissions and a polypropylene bottle for urine submission. These kits may be returned to SLED by hand delivery or through mail services. Urine/Blood collection forms are available for download at any state breath testing facility from the DMT breath alcohol testing station.

- i) Medications/Drugs: In the event that drugs or medications are found on the scene of a death investigation and are not involved in a possession case, these substances may be submitted to the Toxicology Department along with biological specimens as supporting history.



- j) **Bloody/Used Syringes:** Syringes containing blood will not be accepted unless the needle is removed or the syringe is packaged in an appropriate, puncture resistant container. Given the small sample volume in a used syringe, if the identity of the contents is known, this should be provided upon submission. Syringes will only be analyzed to assist in attempting to ascertain the presence of drugs/poisons in biological specimens for death investigation studies.

### 3. Specimen Preservation

- a) Fluids should remain refrigerated or frozen until transported to SLED. Wherever possible, do not transport samples in a non-climate controlled vehicle or in an excessively hot vehicle trunk space.
- b) Tissues should be frozen, if possible, prior to receipt by the SLED Evidence Control Department.

### 4. Processing of Specimens

- a) **Accessioning:** No specimen will be analyzed without an iLAB Packing Slip or completed SLED Forensic Services Request Form. These forms are available through the Evidence Control Department at the Forensic Services Laboratory or are available online at [www.sled.sc.gov](http://www.sled.sc.gov). Complete information should include: Subject/victim's name, date of birth, manner of death, preliminary autopsy results if known, date and time of specimen withdrawal (can be marked on the container), additional case history that may be helpful in determining time frames or pertinent clinical observations, and hospital lab findings. **Indicate names of all suspected drugs, poisons or compounds if known or suspected** in the appropriate field during iLAB pre-log (or on the Forensic Services Request Form). Be as specific as possible. This is essential in order to provide a thorough investigation of the case submitted.

**NOTE:** Additional information obtained after sample submission that is revealed to the coroner, pathologist, or investigator should also be supplied to SLED Toxicology personnel. This information may be critical to the analytical approach taken as well as to the final Toxicology report and its interpretation.

- b) **Chain of Custody:** Each specimen container must be labeled with the specimen type and the subject's name. In the case of the blood specimen, the location from which the blood was drawn is needed (e.g. heart, aorta, iliac vein). Multiple subjects may be submitted simultaneously only if the containers/documents clearly indicate each name. Additional toxicological evidence submitted at a later date should be identified as such to ensure that

all evidence is routed to the proper analyst and identified under the proper case number.

## 5. Unusual Specimens

Occasionally, the circumstances surrounding a death (e.g. fire, advanced decomposition, embalmed/exhumed body) may preclude submission of routine physiological specimens. Remember that in these instances, it may not be possible to provide comprehensive toxicological analysis. Quantitation of an analyte may not be possible, therefore only qualitative information may be reported.

Unusual requests outside the normal scope of an investigation should first be directed to the Toxicology Department Supervisor or Technical Leader prior to sample submission.

### B. Specific Case Types for Death Investigation:

#### 1. Traffic Fatality

If an individual meets the following criteria they should be designated as a traffic fatality victim during iLAB pre-log (or on the Forensic Services Request Form):

- a) dies as a result of a traffic accident within 4 hours of the accident
  - b) is at least 16 years of age and
  - c) is a driver, passenger, pedestrian, motorcyclist, bicyclist, or boat occupant,
- At a minimum, blood and ocular fluid samples are requested.

#### 2. Child Fatality

If a child under the age of 18 dies:

- a) as the result of violence, neglect or any suspicious or unusual manner or
- b) when the death is unexpected and unexplained including, but not limited to, possible SIDS, an autopsy will be performed with toxicology analysis requested.

The preliminary Toxicology results should be complete within 48 hours after submission. The suggested death investigation procedure should be followed in these cases. In addition, the child's medical records, description of the scene, postmortem interval, a list of any medications other family members or animals may have, will need to be submitted. It is requested that at a minimum, blood and ocular fluid be submitted in these cases. Supporting specimens may include gastric contents, urine and tissues samples. In cases where the suspected death of the child is by alcohol, drugs or poisons, all recently used baby bottles, baby food containers, drinking glasses or syringes should be submitted. (No analysis will be performed on these items unless toxicology results on the body fluids warrant their analysis.)

3. Unexplained Death, Possible Overdose Cases, Natural Death, Fire Death  
It is requested that at a minimum, blood and ocular fluid be submitted in these cases. Supporting specimens may include urine, gastric contents and tissues samples. The latter may be particularly important when determining acute vs. chronic overdose.
4. Homicide/Suicide Victims  
On homicide and suicide (not alcohol, drug or poison induced) the submission of blood and ocular fluid is requested at a minimum. Typically when the cause of death is known (e.g. gunshot, stabbing, strangulation), only a volatiles analysis and standard drug screen panel will be performed unless the history warrants further testing.
5. Homicide Suspects  
No analysis will ordinarily be performed on homicide suspects unless the subject was apprehended at the crime scene and a witness verifies that the individual did not ingest any alcohol or drugs after the commission of the crime.

C. Suggested Collection and submission of samples in DUI cases:

1. SLED has the statutory responsibility of chemical testing for alcohol and drugs and establishing procedures for collection of body fluid samples for Driving under the Influence (DUI) (Section 56-5-2930), Felony DUI (Section 56-5-2945), Boating under the Influence (BUI) (Section 50-12-112), DUI for Commercial Drivers (Section 56-1-2030) and 56-1-2180, DUI for Aircraft operators (Section 55-1-100), and Driving with Unlawful Concentration (56-5-2933).
2. If a subject:
  - a) Has completed a breath test and the arresting officer has reasonable suspicion that the subject is under the influence of drugs other than ethanol; a **urine** sample may be requested.
  - b) Is unable to complete a breath test, because the subject could not be released from a licensed medical facility or is unconscious; a **blood** sample may be requested.

**\*\*NOTE\*\*** Failure to obtain the appropriate physiological sample may result in court exclusion of the toxicology results.
3. In Felony DUI cases, BOTH blood and urine can be requested and consent by the individual is not required. It is requested that both specimens be collected and submitted in Felony cases. These samples can be taken in addition to any breath analysis that has been performed in Felony cases.

4. Under certain circumstances, such as interference detected by a breath instrument, a blood sample may be requested for the analysis of ethanol or other interfering potentially impairing volatiles.
5. Should the subject request their own blood test, the arresting officer may take the individual to a licensed medical facility to have the sample drawn at the individual's expense and the officer may submit the sample to the SLED Forensic Services Laboratory for the individual for testing. SLED will not accept samples directly from civilians; the sample must be submitted through the law enforcement community.
  - a) The suggested procedures for obtaining blood and urine samples is referenced in the SC Code of Regulations, Section 73-2.1 (See section G below). All blood and urine samples will be obtained at a licensed medical facility, will be placed into the appropriate containers for transport to SLED. All fluids should remain refrigerated or frozen until transported to SLED. Wherever possible, do not transport samples in a non-climate controlled vehicle or in an excessively hot vehicle trunk space. If possible, transport in an ice chest.
  - b) In order for the sample to be accepted by SLED, a completed Forensic Services Request Form or iLAB equivalent should accompany the specimen. It is requested that a copy of the Urine/Blood Collection report also accompany the sample as it has important information including the date and time of arrest and the time of test.
  - c) If alcohol or drugs were present at the scene or if the subject states that they are currently taking medications, list these in the appropriate field during iLAB pre-log (or on the Forensic Services Request Form). Remember, the Toxicologist is working with limited sample volume and many substances require special separate analytical procedures for their identification. A complete history is necessary to ensure proper sample analysis.

D. Criminal Sexual Conduct (CSC) Cases:

Criminal Sexual Conduct cases are particularly sensitive to the time frame between when the incident occurred and when forensic samples were drawn. It is requested that officers request blood and urine specimens. A complete incident report is especially helpful in determining the scope of analysis in CSC cases. Analysis may be limited when the time between sample collection and the time of incident becomes extended. Testing will proceed in blood and urine, if it is available, and the sample was drawn within 12 hours of incident. Testing will proceed in urine only if available and the sample was drawn within 36 hours of incident. If time between draw and incident exceed these parameters, no testing will be performed without consent of the Toxicology Department Supervisor or Technical Leader.

E. Moonshine Cases:

When analysis of moonshine is requested the samples should be submitted in an airtight container, often a jar with a secure screw lid works well. Only 20 mL of sample are requested however the sample volume should almost fill the submission container to prevent volatiles from evaporating into the headspace of the container.

F. Sample Rejection:

1. If prior toxicological testing has been performed, other than a breath test, any testing by the SLED Forensic Toxicology Department may be precluded or limited to specific testing not previously performed.
2. Samples considered contaminated or unsuitable for analysis may be rejected for toxicological analysis.
3. Samples may be rejected when the iLAB Packing Slip or Forensic Services Request Form does not give sufficient information or is not filled out completely.
4. Samples may be rejected in any occurrence where a physiological specimen is not properly labeled with the victim's or subject's name or where the name is inconsistent with the iLAB Packing Slip or Forensic Services Request Form.
5. Samples may be rejected if the outer packaging or samples themselves appears tampered with or otherwise compromised.

G. Regulations:

*Below an excerpt from Chapter 73 of the Regulations from the SC Code of Law:*

**73-2.1 Suggested Procedures for Obtaining and Handling Blood and Urine Samples**

- A. Obtaining and Handling Blood and Urine Samples. The South Carolina Law Enforcement Division (SLED) recommends the following procedures by which blood and urine samples are to be obtained and handled if such samples are taken from persons arrested for DUI (1976 Code 56-5-2930 or 56-5-2950, as amended) and are taken under authority of 1976 Code 56-5-2950, as amended. Other procedures that meet appropriate medical standards are acceptable as well.
- B. Reimbursement Procedures. The cost for obtaining a urine or blood sample shall be set by the Chief of SLED. Reimbursement for obtaining samples shall be made by mailing a copy of the SLED Urine/Blood Collection Report form for each sample collected. More than one collection report may be submitted with each invoice.
- C. Suggested Procedures for Obtaining and Handling Urine Samples by Individuals so Authorized, Using Appropriate Collection Materials.  
Note: Step 2 should be performed in view of subject and a witness of same sex.
  1. Take an unused, uncontaminated container and remove cap or lid.
  2. Hand the container to subject with instructions to fill container.

3. Have subject immediately return filled urine container. Replace cap or lid on container and tighten down to prevent leakage.
  4. Label container with the following information: Name of subject, time and date of sample collection, and name of person collecting sample.
  5. Place a piece of tape across cap or lid and seal to sides of container. Person sealing container should initial tape.
  6. Fill out all information on Urine/Blood Collection Report Sheet.
  7. As soon as possible after specimen collection, deliver sealed sample and Urine/Blood Collection Report to SLED Forensic Services Laboratory for analysis.
- D. Suggested Procedures for Obtaining and Handling Blood Samples by so Authorized, Using Appropriate Collection Materials.
1. Clear venipuncture site with non-ethanol skin preparation.
  2. Withdraw blood and place in an unused, uncontaminated vial. Vials that contain both an anticoagulant and a preservative are preferred.
  3. Cap vial securely.
  4. Place following information on label: Name of subject, time and date of blood withdrawal, and name of person withdrawing blood.
  5. Fill out information on Urine/Blood Collection Report.
  6. Wrap blood vial securely in suitable material for transport.
  7. As soon as possible after specimen collection, deliver sealed sample and Urine/Blood Collection Report to SLED Chemistry Laboratory for analysis.

### **III. SPECIAL CONSIDERATIONS**

Any questions regarding special requests for analysis should be directed to the Toxicology Department Supervisor or Technical Leader for consideration. Analysis which extends beyond the routine testing outlined in this manual may be performed at special request. Contact the department for sample collection procedures, packaging and the minimal sample volume requirements for these special submissions.

### **IV. REPORT INTERPRETATION**

Any questions pertaining directly to a particular case or signed report issued by the SLED Toxicology Department should be directed to the case analyst or, in their absence, the Toxicology Department Supervisor. The toxicologist can provide interpretation and explanation of any toxicological findings and their significance to the case.

The results portion of the official report is separated first by sample type. Any findings from a particular sample will be listed under that sample. Under each sample type, the results are further divided based on the analysis type and subsequent findings. Not all analysis types will be performed on all sample types. Header types are the same for

each type of analysis and may provide the following information: compound name, result, reporting units, and threshold.

Types of analysis and typical results for these sections are detailed as follows:

- A. Analysis by Headspace Gas Chromatography (HSGC) and/or Headspace Gas Chromatography/Mass Spectrometry (HSGC/MS).
  - Results of volatiles analysis to include ethanol and other volatile concentrations can be found in this section.
- B. Screen by Enzyme Linked Immunosorbant Assay (ELISA).
  - Negative drug screens performed by this method will be listed in this section as well as any positive screens where there was insufficient sample for confirmation/quantitation.
- C. Analysis by Gas Chromatography/Mass Spectrometry (GC/MS).
  - Results from drug quantitations in blood/tissues will be reported in this section.
  - Drugs confirmed in urine and/or gastric contents will be reported in this section.
  - If a general drug screen was performed using GC/MS only and no compounds of concern were identified, it will be reported in this section.
- D. Analysis by Liquid Chromatography/Mass Spectrometry (LC-MS/MS).
  - Results from drug quantitations in blood and/or tissues will be reported in this section.
  - Drugs confirmed in urine and/or gastric contents will be reported in this section.

## TRACE EVIDENCE DEPARTMENT

---

### I. CAPABILITIES AND SERVICES

The following types of evidence are analyzed by the Trace Evidence Department:

- Gunshot Primer Residue (P-GSR)
- Fire Debris
- Paint
- Fibers
- Glass
- Explosives
- Bank Dye – 1-Methyaminoanthroquinone (1-MAAQ)
- Pressure Sensitive Tape
- Physical Fit
- General Physical and Chemical Analysis
  - Pepper Spray

#### A. Gunshot Primer Residue

Gunshot primer residue (P-GSR) analysis is performed on particle lifts collected from people suspected to have been in the vicinity of a gun when it was fired. Samples from clothing of non-victims and any other location/object (vehicle, door, etc.) where gunshot residue would have been deposited can also be analyzed. Gunshot primer residue analysis is most probative when the suspect states that he or she has not been in the vicinity of a gun when it was fired, handled a firearm, or been in contact with anything that may have gunshot residue on it, within six hours of an incident.

#### B. Fire Debris

Fire debris analysis tests for the presence of ignitable liquids. Gasoline and other petroleum products may be identified by this analysis. It is extremely important to package this evidence properly.

#### C. Paint

Typically, known paint standards are compared to unknown paint samples to determine if they share a common source. Sources of paint that can be analyzed can include vehicles, doors, windows, walls, tools, boats, bicycles, trains, safes, and mailboxes. In some cases, it may be possible to provide make, model and year ranges of vehicles involved in hit and run accidents.



**D. Fibers**

Typically, known fiber standards are compared to unknown fiber samples to determine if they share a common source. Fiber evidence may link a suspect to a crime scene or to a victim.

**E. Glass**

Glass evidence is commonly encountered in vehicular hit and runs, burglaries, homicides, and assaults. A known glass standard is compared to an unknown glass sample to determine if they have a common source. For example, a hit and run victim's clothing may contain glass from the windshield of the suspect vehicle or a burglary suspect's clothing or shoes may contain glass from a broken window at the crime scene.

**F. Explosives**

Explosives evidence includes suspected explosive residue and exploded/unexploded devices. All devices **must** be rendered safe before submission to the laboratory. This evidence includes pipe bombs, chemical reaction bombs, improvised explosive devices, and pre-cursor components used to manufacture an improvised explosive device.

**G. Bank Dye – 1-Methylaminoanthraquinone (1-MAAQ)**

A special type of explosion involving bank dye packs can be analyzed for the presence of 1-Methylaminoanthraquinone (1-MAAQ). 1-MAAQ can be identified on a suspect, on their clothing, on any money recovered or on any items in the vicinity of the explosion.

**H. Pressure Sensitive Tape**

Typically, a roll of tape from a suspect is compared to unknown pieces of tape found on a victim or to pieces of tape left at a scene. Tape types that can be analyzed can include duct tape, masking tape, clear packaging tape, and electrical tape.

**I. Physical Fit**

The purpose of this examination is to physically fit evidentiary materials back together along fractured edges. This examination can be performed on any item that displays a fractured edge. Some examples are cloth, glass, paint, plastic, metal, tape, concrete and wood. When accomplished, this examination provides substantial evidence that the materials were, at one time, a single item.

**J. General Chemical and Physical Analysis**

Common types of evidence in this category include pepper sprays and unknown white powders.

## II. EVIDENCE COLLECTION, PACKAGING, AND SUBMISSION PROCEDURES

- A. **Gunshot Primer Residue – Use the SLED provided GSR kits for all GSR collection. These kits are manufactured by TRITECH Forensics and are designated as “GSR-SEM (Q) SC”.**

### *P-GSR Collection from Hands*

1. Follow the directions that are included in the GSR kit. They explain collection, packaging, and submission of P-GSR evidence.
2. Collect the evidence as soon as possible, it is optimal to collect P-GSR evidence prior to transporting the subject.
3. Do not collect a kit on a living subject if more than six hours has passed from the time of the shooting incident. Kits collected beyond six hours on living subjects will not be analyzed.
4. Complete **ALL** of the information on the collection sheet. The incident date/time and the collection date/time is critical information that is required for analysis.
5. The collection time on the GSR paperwork refers to the actual time the kit was collected and not the time the paperwork was completed. The collection of GSR kits from victims’ hands is most probative when the victim sustained a gunshot wound from a **substantial** distance.

### *Submission of P-GSR Evidence from Suspect’s Clothing*

1. The clothing must be linked to the incident and collected within a reasonable amount of time. It is best practice to collect suspect clothing as soon as possible.
2. Package dry clothing in a sealed bag. Package all items separately. P-GSR samples will be collected by laboratory personnel.
3. If the suspect was wearing gloves, and the gloves are to be submitted to the laboratory, package each glove separately.
4. Clothing from victims will not be analyzed.

### *P-GSR Collection from a Vehicle*

1. Vehicles from which it is suspected that a firearm has been discharged:
  - Collect no more than four particle lifts per vehicle.
    - Typical areas can include, but are not limited to, the dashboard, the headliner, interior of doors, and the back of headrests.
    - The presence of gunshot primer residue in a particular area cannot definitively determine that a firearm was discharged from a particular area of the vehicle.

- The presence of gunshot primer residue found in a vehicle can come from being in the vicinity to the discharge of a firearm or coming into contact with an item that has gunshot primer residue on it.
  - The time frame in which gunshot primer residue was deposited cannot be determined.
2. Vehicles from which it is suspected that a subject has transferred gunshot primer residue onto various areas of the vehicle:
    - The collection of two particle lifts for secondary transfer is usually sufficient.
      - Typical areas for transfer from the driver include, but are not limited to, the steering wheel and the gearshift.
      - Typical areas for transfer from a passenger include the interior door handle or seatbelt.
      - The time frame in which gunshot primer residue was deposited cannot be determined.
  3. Samples collected from the exterior of a vehicle will not be routinely analyzed unless there are extenuating circumstances. For example, if a firearm is discharged across the hood or roof of the vehicle, these areas may be collected.
  4. The make, model, and tag number/VIN of the vehicle should be notated as the 'subject's name'.
  5. Note whether other evidence collection took place prior to the GSR collection, i.e., DNA or fingerprints.

## **B. Fire Debris**

Each item of evidence should be packaged individually in an air tight container.

### *Liquid Samples*

1. Liquid samples include any suspected ignitable liquids found in containers at or near the fire scene. Pour the liquid sample from the container into a small sealable glass bottle or vial. This evidence can also be collected with gauze and packaged like a solid sample. One or two fluid ounces are more than sufficient for analysis.
2. Do not use polystyrene bottles.
3. Cushion glass bottles to prevent them from breaking during transport and make certain to secure all caps and lids.

### *Solid Samples*

1. Collect and seal the samples as quickly as possible. Most ignitable liquids are extremely volatile compounds and will evaporate quickly. Do not over fill the evidence containers. Leave at least one third of the container empty above the sample.

2. Use lined metal paint cans, canning jars, heat sealable nylon bags, or evidence bags made for fire debris evidence. Do not use paper bags or other plastic bags (heat sealed evidence bags, trash bags, biohazard bags, etc.) to package this evidence.
3. If sample debris is too large for the container, cut it into smaller pieces. Make sure that tools used to perform this are new or cleaned to prevent cross-contamination.
4. All soil samples should be frozen or refrigerated as soon as possible. Inform the laboratory that a soil sample is being submitted.
5. Non-burned (non-charred) control samples can be taken from carpet, tile, linoleum flooring, or any other synthetic material found at the scene.
6. Samples that are to be submitted for other analyses such as DNA or Latent Prints may have to be evaluated upon submission to the laboratory.

### **C. Paint**

1. Paint samples should be collected by cutting the sample to the substrate. This includes automotive paint samples and architectural paint samples. A quarter size sample is sufficient for analysis but larger pieces may be submitted if necessary (bumpers, hoods, etc.).
2. In hit and run cases, be very careful when collecting the victim's clothing. Paint chips may be loosely adhered to the clothing. Package each item separately and include all articles of clothing. Also, include any items the victim may have been carrying.
3. Always dry any wet clothing before submission to the laboratory.
4. If a bicycle is involved in a hit and run case, submit the bicycle as well as the victim's clothing for analysis.
5. If a moped is involved in a hit and run case, submit any broken pieces of the moped or the whole moped, as well as the victim's clothing for analysis.
6. Collect paint standards from each area of the suspect vehicle that exhibits possible damage. Paint can vary in composition from different areas of the vehicle. Clearly label each standard to indicate the area from which it was collected.
7. Double paint transfers can occur in hit and run cases involving two or more vehicles. Collect all loose paint chips found at the scene. If unknown paint smears are present on a vehicle, collect them by cutting them out. Do not collect one sample to be used as a standard and as an unknown; collect separate samples. Cut out a section of paint from an area adjacent to the damaged area. This sample will serve as the paint standard from that vehicle. Collect samples in the same way for all vehicles involved.

8. Package paint samples in envelopes or small tins. If the sample is too large for an envelope or a tin, it can be sealed in a paper bag or put in a box. For very small samples, enclose the sample in a folded piece of paper and then seal it in an envelope. Be very careful to tape all corners of the envelope to prevent unintentional loss of the evidence.
9. For architectural paint samples, traces of paint may be found on the tools used to gain entry into a building or on the tool used to pry open a safe. Package tools in envelopes or boxes, but be sure to cover the areas of interest with bags. Cut out paint standards from the area that was damaged (usually window or door jambs).
10. Contact the Firearms Department before collecting samples if you are requesting a tool mark examination be performed in addition to the paint analysis.

#### **D. Fibers**

1. Collect unknown fiber evidence with tweezers and place in an envelope or appropriate packaging. If an envelope is used, carefully seal all edges with tape. Post-It or sticky notes may also be used to package fiber evidence.
2. Submit appropriate standards (i.e. suspect/victim clothing, carpet, trunk liner, etc.) as standards for any unknown fiber evidence. Package each item separately. Handle this evidence as little as possible to prevent loss.
3. If fibers are imbedded in an item, submit the whole item to the laboratory. Do not try to remove the embedded fibers, this could destroy the evidence.
4. Always dry any wet clothing before submission to the laboratory.
5. Do not let suspect and victim garments come into contact with each other. Make certain to package these items separately.
6. If an unknown fiber must be collected with tape, be certain to use water soluble tape for the collection. Any other tape will damage the fiber evidence and possibly render it useless for analysis. Contact the Trace Evidence Department for information on ordering water soluble tape.

#### **E. Glass**

1. Collect glass evidence with non-metallic utensils and place any glass fragments in plastic containers or in folded paper packages within a sealed container.
2. Any evidence that may contain glass should be packaged separately.
3. Standards need to be collected from all potential glass sources. This may include mirrors, windshields, bottles, or any broken windows.

#### **F. Explosives**

1. Make certain the device has been rendered safe before submission to the laboratory. The laboratory will not accept a device that has not been rendered safe.
2. When collecting bulk explosive samples contact the Trace Evidence Department for collection instruction.
3. When possible, submit standards collected from the scene or from the suspect.
4. Identify the type of disruptor used and submit a standard if possible.
5. When submitting residue from a suspected chemical reaction bomb do not place it in sealed bottles or cans. Another chemical reaction could occur if enough of the residue is present. Use care when handling this evidence; the liquid is usually a strong acid or base which could burn the skin. It is recommended that this type of evidence be packaged in small plastic buckets or plastic containers.

#### **G. Bank Dye – 1-Methylaminoanthraquinone (1-MAAQ)**

Any object or person that has been exposed to 1-MAAQ will be red/pink in color.

1. If there is evidence suspected to contain 1-MAAQ, submit it to the laboratory for analysis. Package the items in sealed paper bags or boxes.
2. If a sample needs to be collected from a person's skin, call the laboratory for further instructions.

#### **H. Pressure Sensitive Tape**

1. Proper collection and storage of tape evidence is essential. Because tape has such a strong adhesive, do not package it so that the adhesive sticks to the packaging or to itself. Clear check sleeves are recommended for packaging tape evidence. Call the Trace Evidence Department to obtain ordering information on check sleeves. Rolls of tape can be packaged in paper or plastic bags.

#### **I. General Physical and Chemical Analysis**

1. Use basic rules of evidence collection. Do not package standards and unknown evidence together. Call the Trace Evidence Department with any questions.

#### **J. Pepper Spray Analysis**

1. If there is evidence suspected to contain pepper spray, submit it to the laboratory for analysis as soon as possible. **This evidence is time sensitive.** Package the items in sealed paper bags or boxes.
2. If a sample needs to be collected from a person's skin, call the laboratory for further instructions.

### **III. SPECIAL CONSIDERATIONS**

The Trace Evidence Department does not perform the following types of analysis:

- Soil
- Wood
- Filament
- Hair (Some wigs are composed of synthetic fibers and those can be analyzed.)
- Distance Determination

P-GSR found on a person's hands cannot be matched to a particular gun.

The presence or absence of P-GSR on the victim of a gunshot wound cannot determine whether the shooting was the result of a homicide/assault, accident, suicide, or self-defense.

#### **IV. REPORT INTERPRETATION**

Due to the variety of evidence that the Trace Evidence Department analyzes, if you have a case specific question, contact the Trace Evidence Department.